TRANSACTIONS

OF THE

AMERICAN SOCIETY OF CIVIL ENGINEERS

INDEX

VOLUME 130

1965

SUBJECT INDEX, PAGE 843

AUTHOR INDEX, PAGE 869

SUBJECT INDEX

AERATION
Minimal Solids Aeration Activated Sludge, M. W. Tenney, R. H. Johnson, Jr., and J. M. Symons, 705

AERONAUTICS
A Study of Hypersonic Aircraft, Douglas E. Wall, 799

AERO-SPACE TRANSPORT
Analysis of Master Plan for Chicago O'Hare Airport, Martin A. Warskow and Howard C. Burns, 63
An Operational Look at Airport Design, Robert C. Huber, 566
Application of Supersonic Aircraft to Airline Operations, Henry D. Fellows, 721
A Study of Hypersonic Aircraft, Douglas E. Wall, 799
Automobile Parking Requirements at Airports, Wolfgang S. Homburger and William R. Eager, 805
Baggage Handling: Passenger and Baggage Processing at Air Terminals, Bruno H. Hake, 203
Civil Aviation to 1970, Robert Horonjeff and Gale Ahlborn, 18
Economics and Finance in Airport Planning, Belford Brown, 488
Forecasting Airport Traffic, Norman L. Johnson, 665
Ground Control of Airport Traffic, Robert S. Nickelsberg, 573
Operational Experience at Dulles Airport, Arven H. Saunders, 795
Operations of the Supersonic Transport in the Terminal Area, Francis T. Fox, 581
Rigid and Stiff Airport Paving, Henry P. Carothers, 791
Supersonic Transport Development Program, Ray D. Kelly, 555
Trends in Automobile Parking at Airports, Charles A. Lawler, 583

AGGREGATES
Lightweight Aggregate Prepared from Fly Ash by Consolidated Edison in New York City, A. S. Pearson, 411

AIRCRAFT
An Operational Look at Airport Design, Robert C. Huber, 566
Application of Supersonic Aircraft to Airline Operation, Henry D. Fellows, 721
A Study of Hypersonic Aircraft, Douglas E. Wall, 799
Civil Aviation to 1970, Robert Horonjeff and Gale Ahlborn, 18
Supersonic Transport Development Program, Ray D. Kelly, 555

AIR POLLUTION
Air Pollution Control in New York State, Alexander Rihm, 89
Application of Acoustics in Air Pollution Problems, Joseph C. F. Chow, 624
Incineration (Symposium)—Air Pollution from Incinerators, Harold G. Meissner, 495
Problems with High Chimneys, M. Zar, 64

AIRPORTS
Airplane Fuel—From Barge to Plane, 478
Analysis of Master Plan for Chicago O'Hare Airport, Martin A. Warskow and Howard C. Burns, 63
An Operational Look at Airport Design, Robert C. Huber, 566
Automobile Parking Requirements at Airports, Wolfgang S. Homburger and William R. Eager, 805
Baggage Handling: Passenger and Baggage Processing at Air Terminals, Bruno H. Hake, 203
Civil Aviation to 1970, Robert Horonjeff and Gale Ahlborn, 18
Economics and Finance in Airport Planning, Belford Brown, 488
Forecasting Airport Traffic, Norman L. Johnson, 665
Ground Control of Airport Traffic, Robert S. Nickelsberg, 573
Houston's Jetero Airport: Development of Terminal and Related Areas, Robert O. Grimes, 263
Operational Experience at Dulles Airport, Arven H. Saunders, 795
Operations of the Supersonic Transport in the Terminal Area, Francis T. Fox, 581
Rigid and Stiff Airport Paving, Henry P. Carothers, 791
Subgrade Stabilization Under an Existing Runway, S. Chas. Dearstyne and Gene J. Newman, 215
Trends in Automobile Parking at Airports, Charles A. Lawler, 583

ALUMINUM
Fatigue of Joints in Aluminum Alloy 6061-T6, Glenn E. Nordmark and John W. Clark, 744
What Is Available in Structural Aluminum, J. Robert Stemler and John W. Clark, 213

ASCE (Code of Ethics)
Maintaining Ethical Standards, William H. Wisely, 184

ASCE (Conferences)
Technical Programs in ASCE, William H. Wisely, 37

ASCE (General)
Technical Programs in ASCE, William H. Wisely, 37

ASCE (Membership)
The Composition of the Engineering Profession, William H. Wisely, 533

ASCE (National Affairs)
ASCE Activity in Public Affairs, William H. Wisely, 351

ASCE (Presidents)
A Design for the Future, Annual Address of Wallace L. Chadwick, 807

ASCE (Technical Divisions)
Practical Results of Hydraulics Research: Hydraulics Division Committee on Research Reports, Harold M. Martin, Chmn., 347
Technical Programs in ASCE, William H. Wisely, 37

ANALOGS
Electric Analogs in Time-Settlement Problems, Patrick Domenico and Glen Clark, 595

ANTARCTICA
Daylight Star Observations in Antarctica, Douglas R. Lee, 221

ARCH DAMS
Vaiont Reservoir Disaster, George A. Kiersch, 155
Yellowtail Dam on Big Horn River, Instrumented for Structural Behavior Studies, Keith Jones, 567

ARCHES
Aeroelastic Vibration of a Steel Arch, Richard R. Bradshaw, 319
Blast Loading of Small Buried Structures, Jay R. Allgood, 554
Collapse of Arches Under Repeated Loading, Vicenzo Franciosi, Giuliano Augusti, and Renato Sparacio, 391
Foundation Modulus Tests for Karadj Arch Dam, W. A. Waldorf, J. A. Veltrop, and J. J. Curtis, 271
Parabolic Arches of Variable Thickness, Alfred L. Parme and Eugene P. Holland, 779

ASPHALTS
A City Engineer Talks About Paving, Gilbert B. White, 278
Asphalt Paving Equipment, John J. Laing, 475
Oregon Sets the Pace on the Interstate, Carl S. Larson, 196

AUDITORIUMS
A Special Report on the World's Fair, Frank J. Schneller, 487
Civil Engineers Build for the Fair, William Whipple, Jr., 483

AUTOMOBILES
Driveway Approaches Designed for Automobile Access, Albert W. Huelsman, 261

BARGE LIFT
Belgian 223-Ft Barge Lift Keeps Vessels Afloat on Inclined Railway, Hal W. Hunt and J.K. Huckerby, 715

BEACHES
Wave Breakers on a Beach and Surges on a Dry Bed, J. C. Freeman and Bernard Lē Mehautē, 759

BEAMS (Structural)
Analysis of Composite Beam Bridges by Orthotropic Plate Theory, Vilis Vitols, Rodney J. Clifton, and Tung Au, 3
Behavior of Hybrid Beams Subjected to Static Loads, Ronald W. Frost and Charles G. Schilling, 604
Bending and Buckling of Thin-Walled Open-Section Rings, James A. Cheney, 85
Deflection of Circular Curved I Beams, Ross A. Close, 419
Depth Selection of Built-Up I-Sections, J. S. Alagia, 687
Die Cutting Cuts Cost of Open-Web Steel Beams, Leonard Kates, 313
Eigen-Matrix Method for Beams and Plates, Bennosuke Tanimoto, 103
Flexural Calculation of Nonuniform Members, Shou-ling Wang, 164
Flexural Fatigue Tests of Prestressed Steel I-Beams, W. Daniel Reneker and Carl E. Ekberg, Jr., 561
Flow Graph of Moment Distribution, Chuan C. Feng and Richard D. Benton, 218
General Computer Analysis of Beams, John E. Goldberg, John L. Bogdanoff, and William D. Glauz, 80
Lateral Stability of Glued Laminated Beams, R. F. Hooley and B. Madsen, 781
Lumping of Mass in Calculation Vibration Response, V. H. Neubert, 219
Minimum Weight Plastic Design of Continuous Frames, Donald A. Sawyer and Linton E. Grinter, 711
Moment Coefficients for Fixed-End Beams to be Used in the Three-Moment Equation, Thomas D. Y. Fok and Thomas F. Mosure, 449
Orthotropic Beams Under Polynominal Loads, Isadore K. Silverman, 634
Reinforcement Requirements for Girder Web Openings, Edmund P. Segner, Jr., 645
Section Modulus of Beams with Unsymmetrical Cover Plates, Tom L. Underwood, 286
Strength of Elastically Stabilized Beams, Robert W. Haussler, 637
Stresses in a Layered Half-Plane, K. T. Sundara Raja Iyengar and R. S. Alwar, 404

BEAM-COLUMNS
Finite Beam-Columns on Elastic Foundation, K. T. Sundara Raja Iyengar and S. Anantharamu, 141

BEARING CAPACITY
Load Transfer in a Step-Taper Pile, Elio D'Appolonia and John A. Hribar, 353
Prediction of Pile Capacity by the Wave Equation, Paul W. Forehand and Joseph L. Reese, Jr., 399
Variable-Factors Theory of Bearing Capacity, George C. Y. Hu, 291

BLASTING
Analysis of Blast Effects on Pipelines, George M. McClure, Thomas J. Atterbury, and Noah A. Frazier, 603
Blasting Design Criteria, Marvin Gates, 269
New Light on Blasting Vibration Effects, Harold H. White, 252
Subway Tunnel Construction in New York City, Gail B. Knight, 503

BOLTS
Calibration of A325 Bolts, John L. Rumpf and John W. Fisher, 295
Long Bolted Joints, Robert A. Bendigo, Roger M. Hansen, and John L. Rumpf, 274

BOLTS Continued
Stronger Structural Bolt—Will Cut Costs, Speed Construction, Fred E. Graves and William A. Milek, 557

BREAKWATERS
Rubble-Mound Breakwater Design for Refuge Harbor, John R. Hyland, 597
Wave Breakers on a Beach and Surges on a Dry Bed, J. C. Freeman and Bernard Lē Mehautē, 759

BRIDGES (Structures)
Analysis of Composite Beam Bridges by Orthotropic Plate Theory, Vilis Vitols, Rodney J. Clifton, and Tung Au, 3
A Tunnel Favored for English Channel Crossing, John O. Bickel, 304
Bridge Costs, Harris K. Mauzy and William J. Yusavage, 133
Bridges on Stockholm Motorway, S. Lund, 731
California Builds Experimental Orthotropic Plate Bridge, Raymond E. Davis and Ostap Bender, 547
Direct Stress Analysis of Orthotropic Bridge Slabs, Alexander Coull, 13
Model Balsa-Wood Bridges in Education, Boyd C. Ringo, 83
Precast Segmental Construction for Long-span Bridges, Ben C. Gerwick, 44
Seattle Viaduct Redesigned Using CPM, Roy W. Morse, John E. Arnberg, Douglas L. Jonas, 523
Seismic Analysis of Bridges on Long Piles, Joseph Penzien, Charles F. Scheffey, and Richard A. Parmelee, 321
Steel Deck Bridges with Long Rib Spans, Roman Wolchuck, 115
The Additional Cooper River Bridge, Frederick H. Sterbenz, 513
The Case for the Galvanized Bridge, J. R. Hall, 564

BUCKLING
Axisymmetrical Deflections of Shallow Conical Shells, G. A. Wempner, 628
Bending and Buckling of Thin-Walled Open-Section Rings, James A. Cheney, 85
Buckling Loads for Stepped Columns, John W. Harvey, 618
Buckling of a Prestressed Circular Ring, John E. Goldberg and John L. Bogdanoff, 767
Buckling of Longitudinally Stiffened Cylinders, Jeng C. Shang, Walter J. Marulic, and Rolland G. Sturm, 667
Deflection of Hinged Rings Under Uniform Pressure, James A. Cheney, 451
Development of Boundary Layers in Buckled Plates, Ernest F. Masur and C. H. Chang, 67
Elastic and Inelastic Buckling of Portal Frames, Kuang-Han Chu and Algis Pabarcius, 773
George E. Sliter and Arthur P. Boresi, 147
Elastic Buckling of Rigidly-Jointed Braced Frames, S. J. Britvec and A. H. Chilver, 173
Elastica Supported at Midpoint by a Spring, Experimental Buckling of Thin Shells of Revolution, John J. Burns, Jr., 528
Experiments on Stability on Spherical Caps, Ta-Cheng Loo and Ross M. Evan-Iwanowski, 69
Lateral Stability of Glued Laminated Beams, R. F. Hooley and B. Madsen, 781
Load-Deformation Behavior of Shells of Revolution, Steven C. Batterman, 704
Numerical Methods in Bending and Buckling of Plates, A. N. Sherbourne, 51
Solution of Buckling Problems by Reduction Method, P. Shuleshko, 315
Strength of Elastically Stabilized Beams, Robert W. Haussler, 637

BUILDINGS
Design of Haunched Beams by Fixed Points, Stanton E. Huey, 613
The Alaska Earthquake—Effect on Buildings, E. F. Rice, 223
The Role of the Civil Engineer in Civil Defense, Neal Fitz Simons, 118
Vibrational Transfer from Shear Buildings to Ground, Lydik S. Jacobsen, 691

BUILDING CODES
The New Welding Code for Buildings, Arsham Amirikian, 396

CABLES
Cable Movements Under Two-Dimensional Loads, W. Terence O'Brien and Arthur J. Francis, 737
Stress Analysis of Prestressed Suspended Roofs, Avinadav Siev and J. Eidelman. 518

CALIFORNIA
Stabilization of Sand Dunes at Vandenberg Air Force Base, John Peters and Joe Sciandrone, 344

CANALS
A Sea-Level Canal to Link the Atlantic and the Pacific, Senator Warren G. Magnuson, 405
Belgian 223-Ft Barge Lift Keeps Vessels Afloat on Inclined Railway, Hal W. Hunt and J. K. Huckerby, 715
Nuclear Excavation of a Sea-Level Isthmian Canal, Ernest Graves, Jr., 461
Plastic Surgery on Irrigation Areas, Kent S. Ehrman, 29
Transitions for Canals and Culverts, William P. Simmons, 35
Underwater Inspection of Test Fill in Gatun Lake for Dam to Serve Panama Canal, Anthony P. Mann, 241

CAVITATION
Construction Finishes and High-Velocity Flow, James W. Ball, 382
Pressure Generated by Cavitation in a Pipe, Wen-Hsiung Li and James P. Walsh, 789
Water Jet Pump, N. H. G. Mueller, 311

CEMENTS
Vacuum-Cast Refractory Castables, David J. Damiano, 539

CHANNELS (Waterways)
Control Structures for Sand-Bed Channels, Frederick C. Stepanich, Daryl B. Simons, and Everett V. Richardson, 485
Domain Variations in Channel Seepage Flow, Hubert J. Morel-Seytoux, 176
End Depth for Circular Channels, N. Rajaratnam and D. Muralidhar, 407
End Depth for Exponential Channels, N. Rajaratnam and D. Muralidhar, 765

CHANNELS Continued
Hydraulic Aspects of Arkansas River Stabilization, Margaret S. Petersen, 625
Hydraulic Jump in All Shapes of Horizontal Channels, 75
Natural Roughness Effects in Rigid Open Channels, A. G. Mirajgaoker and K. L. N. Charlu, 544
Plastic Surgery on Irrigation Areas, Kent S. Ehrman, 29
Seepage from Parallel Trapezoidal Channels, Ahmed El Nimr, 127
Shear and Velocity Distribution in Shallow Channels, H. Lundgren and Ivar G. Jonsson, 693
Temporary Flow Measurement in Sewers and Drains, M. H. Diskin, 299
Two-Dimensional Flow Over Sills in Open Channels, Gary Z. Watters and Robert L. Street, 766

CHIMNEYS
Problems with High Chimneys, M. Zar, 64
Slipforming a Chimney 450 Ft High in Nottingham, Ole Wewer, 739

CITY PLANNING
Analytical Methods in Transportation: Digital Simulation of Traffic, Aaron Glickstein, 498
Evaluating Urban Transportation Systems, George Haikalis and E. Wilson Campbell, 479
Interdisciplinary Education for Urban Planning, Harold L. Michael, 797
Metropolitan Drainage Planning in Los Angeles County, M. E. Salsbury, 209

CIVIL DEFENSE
The Role of the Civil Engineer in Civil Defense, Neal Fitz Simons, 118

CLAY (Material)
Consolidation Coefficient: Cohesive Soil Mixtures, Robert L. Kondner and Josè R. Vendrell, Jr., 629
Effect of Preconsolidation on Settlements, Leo Casagrande, 578
Foundation Behavior of Iron Ore Storage Yards, Ralph B. Peck and Tonis Raamot, 783
Problems of Off-Road Transportation, Louis J. Goodman and Ronald A. Liston, 53
Shear Strength of an Anisotropically Consolidated Clay, Bengt B. Broms and M. V. Ratnam, 303
Stability of Cuts in Soft Soils, T. C. Kenney, 171
Stress-Strain Modulus of Clay in Undrained Shear, Charles C. Ladd, 589
Surface Area Measurements and Adsorption of Soils, Michael J. Suess, 131

COASTAL ENGINEERING
Coastal Engineering in Japan, R. L. Wiegel and Kiyoshi Horikawa, 719

COEFFICIENTS
Analysis of Composite Beam Bridges by Orthotropic Plate Theory, Vilis Vitols, Rodney J. Clifton, and Tung Au, 3
Annual Variation of Stream Water Temperature, J. C. Ward, 258
Consolidation Coefficient: Cohesive Soil Mixture, Robert L. Kondner and Josè R. Vendrell, Jr., 629
End Depth for Circular Channels, N. Rajaratnam and D. Muralidhar, 407
Flexural Calculation of Nonuniform Members, Shou-ling Wang, 164
Moment Coefficients for Frame Analysis, Frederick P. Wiesinger, Seng-Lip Lee and John F. Fleming, 39

COLD WEATHER CONSTRUCTION
Sanitary Engineering in Alaska, Amos J. Alter, 145
The Long Thermopile, Erwin L. Long, 189

COLUMBIA RIVER
Prestressed Anchorage for Large Tainter Gate, Andrew Eberhardt and Jan A. Veltrop, 757

COLUMNS (Structural)
Biaxial Flexure of Columns by Analog Computers, Sherwood P. Prawel, Jr., and George C. Lee, 185
Buckling Loads for Stepped Columns, John W. Harvey, 618
Buckling of Steel Columns Under Arbitrary End Loads, Seng-Lip Lee and G. F. Hauck, 73
Dynamic Stability of Axially Vibrating Columns, I. K. McIvor, 714
Iterative Limit Load Analysis for Tall Frames, Niels C. Lind, 661
Regression Analysis of Reinforced Concrete Columns, Haresh C. Shah, 345
Stability of Elasto-Plastic Wide-Flange Columns, George F. Hauck and Seng-Lip Lee, 94
Zero Sidesway Axis of Rigid Frames, A. J. Celis and P. Glockner, 19

COMPUTATION
Guide to Development and Use of Electronic Computer Programs: Engineering Analysis, Elwyn H. King, 775

COMPUTERS
A Cooperative Computer Center, New Concept for Consulting Engineers, Charles P. C. Tung and David Carsen, 401
Analysis of Composite Beam Bridges by Orthotropic Plate Theory, Vilis Vitols, Rodney J. Clifton, and Tung Au, 3
Analysis of Orthotropic Plate Bridges, Rodney J. Clifton, Jerry C. L. Chang, and Tung Au, 139
Analysis of Sewage Treatment Systems by Simulation, M. Mead Montgomery and Walter R. Lynn, 361
Analytic Methods in Transportation: Planning and Grading Operation for Least Total Cost, L. R. Shaffer, 296
Analytical Methods in Transportation: Digital Simulation of Traffic, Aaron Glickstein, 498
Annual Variation of Stream Water Temperature, J. C. Ward, 258
Biaxial Flexure of Columns by Analog Computers, Sherwood P. Prawel, Jr., and George C. Lee, 185
Computer Systems for Matrix Operations, Herbert Rothman and Peter Reilly, 763
Control Traverses and Their Adjustment, Everett D. Morse, 181
Digital Computers and Environmental Control, Gordon P. Fisher and Walter R. Lynn, 334
Direct Stiffness Solution for Folded Plates, Arnim DeFries-Skene and A. C. Scordelis, 717
Flow Graph of Moment Distribution, Chuan C. Feng and Richard D. Benton, 218

COMPUTERS Continued
General Computer Analysis of Beams, John E. Goldberg, John L. Bogdanoff, and William D. Glauz, 80
General Computer Program for Limit Analysis, Chu-Kia Wang, 161
Ground-Water Management for the Nation's Future—Computer Simulation of Ground-Water Basins, Howell N. Tyson and Ernest M. Weber, 760
Guide to Development and Use of Electronic Computer Programs: Engineering Analysis, Elwyn H. King, 775
Hydrogeologic Electric Analog Computer, William C. Walton and Thomas A. Prickett, 43
Lost River System-A Water Quality Management Study, Gerald T. Orlob and Philip C. Woods, 87
Manpower by Critical Path Method, John A. Keane and Jack D. Trawick, 288
Mathematical Model for Dissolved Oxygen, Robert V. Thomann, 153
Mathematical Model for Transient River Flow, Elvind Kindingstad, 682
Moment Coefficients for Frame Analysis, Frederick P. Wiesinger, Seng-Lip Lee and J. F. Fleming, 39
Moment Equations for Computer Analysis of Frames, Semih S. Tezcan, 673
Nonlinear Behavior of Structural Plane Frames, S. A. Saafan, 197
Numerical Methods in Bending and Buckling of Plates, A. N. Sherbourne, 51
Preliminary Design of Concrete Dams by Computers, Ralph Weaver, 99
Series Solution of Skewed Plates, J. B. Kennedy and M. W. Huggins, 308
Structural Analysis of Multistory Buildings, Ray W. Clough, Ian P. King, and Edward L. Wilson, 729

CONCRETE
Analysis of Composite Beam Bridges by Orthotropic Plate Theory, Vilis Vitols, Rodney J. Clifton, and Tung Au, 3
History and Development of Concrete Pavement Design, Gordon K. Ray, 91
Load Transfer in a Step-Taper Pile, Elio D'Appolonia and John A. Hribar, 353
Quality Control of Concrete, L. D. Long, 549
Rigidity and Strength of Composite Plates, C. W. Beadle, J. W. Dally and W. F. Riley, 777
Subway Tunnel Construction in New York City, Gail B. Knight, 503
What's New in Concrete Paving, E. C. Lokken, 151

CONCRETE DAMS
Preliminary Design of Concrete Dams by Computers, Ralph Weaver, 99
Yellowtail Dam on Big Horn River, Instrumented for Structural Behavior Studies, Keith Jones, 567

CONSOLIDATION
Consolidation Coefficient: Cohesive Soil Mixture, Robert L. Kondner and José R. Vendrell, Jr., 629
Electric Analogs in Time-Settlement Problems, Patrick Domenico and Glen Clark, 595
Settlement Response Caused by Footing Groups, Raymond J. Krizek and Robert L. Kondner, 659
Shear Strength of an Anisotropically Consolidated Clay, Bengt B. Broms and M. V. Ratnam, 303
Stability of Cuts in Soft Soils, T. C. Kenney, 171
Uses of Surcharges in Highway Construction, William F. Kleiman, 623

CONSTRUCTION
Analytic Methods in Transportation: Planning and Grading Operation for Least Total Cost, L. R. Shaffer, 296
Construction Finishes and High-Velocity Flow, James W. Ball, 382
Design and Performance of Mammoth Pool Power Tunnel, Bruce R. Laverty and Klaus R. Ludwig, 416
First Five Years of the Critical-Path Method, William J. Gleason, Jr., and Joseph J. Ranieri, 40
Interest on Capital Invested in Construction, J. F. Muir and Eugen Ruus, 635
PERT and CPM Techniques in Project Management, Restan M. Aras and Julius Surkis, 486
Plastic Surgery on Irrigation Areas, Kent S. Ehrman, 29
Quantity Surveys for Cost Estimates, George W. Heller, 333

CONSTRUCTION EQUIPMENT
Asphalt Paving Equipment, John J. Laing, 475
What's New in Concrete Paving, E. C. Lokken, 151

CONSTRUCTION INDUSTRY
As a Contractor, Do You Carry Adequate Insurance? James Midwinter, 371
Resident Engineer Responsibility on Construction, Irving Kett, 15
The Value of Management in the Construction Industry, 163

CONSTRUCTION PLANNING
Construction Preplanning Pays Off, Robert J. Thonus, 575
The Triangular Bar Chart, George Kostro, 538

CONSTRUCTION PROCEDURE
Increasing the Efficiency of Helicopters on Transmission-Line Construction, E. S. Zobel and R. A. Kravitz, 489
Manpower by Critical Path Method, John A. Keane and Jack D. Trawick, 288

CONSULTANTS
A Cooperative Computer Center, A New Concept for Consulting Engineers, Charles P. C. Tung and David Carsen, 401
Consulting Engineering in Foreign Countries, E. Montford Fucik, 21
Professional Development, the Younger Viewpoint (Symposium)—In Private Practice, Harold L. Loyd, 283
Resident Engineer Responsibility on Construction, Irving Kett, 15
Starting a Consulting Business, Joseph S. Ward, 7

CONTRACTS
The Value of Management in the Construction Industry, H. C. Turner, Jr., 163

CORROSION
The Case for the Galvanized Bridge, J. R. Hall, 564

COSTS
Analysis of Master Plan for Chicago O'Hare Airport, Martin A. Warskow and Howard C. Burns, 63
Bridge Costs, Harris K. Mauzy and William J. Yusavage, 133
Quantity Surveys for Cost Estimates, George W. Heller, 333
Unit Prices Around the World, ASCE Construction Division Committee Report, 362

CRITICAL PATH METHOD
First Five Years of the Critical-Path Method, William J. Gleason, Jr., and Joseph J. Ranieri, 40
PERT and CPM Techniques in Project Management, Restan M. Aras and Julius Surkis, 486
Seattle Viaduct Redesigned Using CPM, Roy W. Morse, John E. Arnberg, Douglas L. Jonas, 523

CULVERTS
Precast T's and Slabs Make Culverts Quickly, John F. Lenard, 431
Transition for Canals and Culverts, William P. Simmons, 35

DAMAGE
Analysis of Blast Effects on Pipelines, George M. McClure, Thomas J. Atterbury, and Noah A. Frazier, 603

DAMS
Flow Slides Prove Hazardous in Tenche Tunnel and Diversion Tunnel for Miraflores Dam, C. Y. Li, 727
Foundation Modulus Tests for Karadj Arch Dam, W. A. Waldorf, J. A. Veltrop, and J. J. Curtis, 271
Ghana's Akosombo Dam—Design and Construction, R. P. Ware and D. R. Hooper, 735
Regulation of the Caspian Sea, Otakar W. Kabelac, 609
Roll-Ramp Lifting Device for Fishway at Priest Rapids Dam, W. R. Martin, 535
Vaiont Reservoir Disaster, George A. Kiersch, 155

DEFLECTION
Cable Movements Under Two-Dimensional Loads, W. Terence O'Brien and Arthur J. Francis, 737
Deflection of Hinged Rings Under Uniform Pressure, James A. Cheney, 451
Deflection of Tall Guyed Tower in Dallas, J. K. Groseclose, 571
Design of Flexible Steel Pipe Under External Loads, Walter H. Cates, 599
Elastica Supported at Midpoint by a Spring, George E. Sliter and Arthur P. Boresi, 147
Flexural Calculation of Nonuniform Members, Shou-ling Wang, 164
General Computer Analysis of Beams, John E. Goldberg, John L. Bogdanoff, and William D. Glauz, 80
Philosophy of Engineering Design of Structures, Malcom S. Gregory, 59
Zero Sidesway Axis of Rigid Frames, A. J. Celis and P. Glockner, 19

DEFORMATION
Structure Designs Governed by Limited Deformations, Jacob Solomon, 477

DISPERSIONS
Sand Transport Studies with Radioactive Tracers, D. W. Hubbell and William W. Sayre, 619

DOCKS
Pier Extension and Repair at Tallmans Island Sewage Treatment Plant at College Point, Remig A. Papp, 306
The Drydock Lock, James R. Ayers, Arden L. Burnett, and Ralph C. Stokes, 471

DOMES
A Special Report on the World's Fair, Frank J. Schneller, Jr., 487
Civil Engineers Build for the Fair, William Whipple, Jr., 483

DRAINAGE
An Experiment on Flow Through Smooth Tile Joints, A. F. Pillsbury, E. H. Taylor, R. W. Pelishek, and J. F. Osborn, 455
Auxiliary Potential Function for Seepage, Bruce B. Schimming and Robert L. Kondner, 769
Design of Tile Drainage for Arid Regions, Hammad Y. Hammad, 749
End Depth for Expotennial Channels, N. Rajaratnam and D. Muralidhar, 765
Indus-Valley—West Pakistan's Life Line, Alexander Karpov, 509
Metropolitan Drainage Planning in Los Angeles County, M. E. Salsbury, 209
Spacing of Drains by an Approximate Method, Gedeon Dagan, 81
Supplement to Peterson's Design of Replenishment Wells, Mahdi S. Hantush, 101
Surface Area Measurements and Adsorption of Soils, Michael J. Suess, 131

DRAINS
Fill Settlement Despite Vertical Sand Drains, George F. Sowers, 685

DRAWINGS
Influence-Line Spectrum by Graphical Construction, Charles G. Salmon, and Donald R. Buettner, 428

DRILLING
Subway Tunnel Construction in New York City, Gail B. Knight, 503

DROUGHTS
Study of Municipal and Irrigation Water Shortages, C. B. Thompson, 446

EARTH DAMS
Ghana's Akosombo Dam—Design and Construction, R. P. Ware and D. R. Hooper, 735
Mechanics of Inclined Filters in Earth Dams, V. J. Patel, A. V. Gopala Krishnayya, and K. L. Arora, 457
Underwater Inspection of Test Fill in Gatun

EARTH DAMS Continued
Lake for Dam to Serve Panama Canal, Anthony P. Mann, 241

EARTHQUAKES
Effect of Site Condition on Earthquake Intensity, John H. Wiggins, Jr., 415
Energy Absorption of Structures Under Cyclic Loading, Kenneth Medearis and D. H. Young, 249
Generation of Artificial Earthquakes, G. W. Housner and P. C. Jennings, 530
The Alaska Earthquake—Effect on Buildings, E. F. Rice, 223

ECONOMICS
Analysis of Master Plan for Chicago O'Hare Airport, Martin A. Warskow and Howard C. Burns, 63
Economics and Finance in Airport Planning, Belford Brown, 488
Evaluating Urban Transportation Systems, George Haikalis and E. Wilson Campbell, 479

EDUCATION
Civil Engineering Education, William H. Wisely, 505
Education for Sanitary Engineers, E. Sherman Chase, 801
Effect of the Space Age on the Engineering Profession, R. W. Johnson, 247
Interdisciplinary Education for Urban Planning, Harold L. Michael, 797
Model Balsa-Wood Bridges in Education, Boyd C. Ringo, 83
Professional Development-The Student's Responsibility, James R. Wright, 793
Professional Development, the Younger Viewpoint (Symposium)—In Teaching, Russel C. Jones, 284
The Scope of Civil Engineering, Charles L. Miller, 385

ELASTICITY
Analysis of Orthotropic Plate Bridges, Rodney J. Clifton, Jerry C. L. Chang, and Tung Au, 139
Analysis of Short Span Folded Plates, Kaveti Seetharamulu and Mangesh G. Kulkarni, 699
Axisymmetrical Deflections of Shallow Conical Shells, G. A. Wempner, 628
Bending and Buckling of Thin-Walled Open-Section Rings, James A. Cheney, 85
Buckling of Steel Columns Under Arbitrary End Loads, Seng-Lip Lee and G. F. Hauck, 73
Dynamic Analysis of Elastic-Plastic Frames, Arthur C. Heidebrecht, Seng-Lip Lee, and John F. Fleming, 33
Elastic Buckling of Rigidly-Jointed Braced Frames, S. J. Britvec and A. H. Chilver, 173
Finite Beam-Columns on Elastic Foundation, K. T. Sundara Raja Iyengar and S. Anantharamu, 141
Foundation Modulus Tests for Karadj Arch Dam, W. A. Waldorf, J. A. Veltrop, and J. J. Curtis, 271
Load-Deformation Behavior of Shells of Revolution, Steven C. Batterman, 704
Response of Elastic Cylinders to Plane Shear Waves, Lawrence J. Mente and Francis W. French, 681
Stresses in a Layered Half-Plane, K. T. Sundara Raja Iyengar and R. S. Alwar, 404

ELECTRONICS
Electronic Guidance for Highway Safety, John J. O'Mara, 519

ENERGY
Estimating Evapotranspiration from Solar Radiation, Marvin E. Jensen and Howard R. Haise, 107
Interest on Capital Invested in Construction, J. F. Muir and Eugen Ruus, 635
Philosophy of Engineering Design of Structures, Malcolm S. Gregory, 59
Shapes for Appurtenances in Stilling Basins, Narayana N. Pillai and T. E. Unny, 643

ENGINEERING MECHANICS
Analysis of Laterally Loaded Gridworks, Thein Wah, 481
Analysis of Spherical Shells with Stress Functions, Ziad M. Elias, 786
Analytic Methods in Transportation: Left Turn Penalties in Traffic Assignment Models, Joseph A. Wattleworth and Paul W. Shuldiner, 346
Analytic Methods in Transportation: Mathematical Car-Following Theory of Traffic Flow, Denos C. Gazis, Robert Herman, and Richard W. Rothery, 78
Analytic Methods in Transportation: Planning and Grading Operation for Least Total Cost, L. R. Shaffer, 296
Axisymmetrical Deflections of Shallow Conical Shells, G. A. Wempner, 628
Bending Analysis for Clamped Rectangular Plates, Leonard R. Herrmann, 251
Bending and Buckling of Thin-Walled Open-Section Rings, James A. Cheney, 85
Biaxial Flexure of Columns by Analog Computers, Sherwood P. Prawel, Jr., and George C. Lee, 185
Circular Plates Loaded into the Plastic Region, Leslie M. Lackman, 787
Deflection of Hinged Rings Under Uniform Pressure, James A. Cheney, 451
Development of Boundary Layers in Buckled Plates, Ernest F. Masur and C. H. Chang, 67
Dynamic Response Functions, Bruce S. Berger, 515
Dynamic Similitude of Underground Structures, Donald F. Young and Glenn Murphy, 439
Dynamic Stability of Axially Vibrating Columns, I. K. McIvor, 714
Elastic and Inelastic Buckling of Portal Frames, Kuang-Han Chu and Algis Pabarcius, 773
Elastica Supported at Midpoint by a Spring, George E. Sliter and Arthur P. Boresi, 147
Elastic Buckling of Rigidly-Jointed Braced Frames, S. J. Britvec and A. H. Chilver, 173
Experimental Buckling of Thin Shells of Revolution, John J. Burns, Jr., 528
Experiments on Stability on Spherical Caps, Ta-Cheng Loo and Ross M. Evan-Iwanowski, 69
Film Flow Along a Vertical Cylinder, Nabil A. Hassan and Joseph B. Franzini, 761
Finite Beam-Columns on Elastic Foundation, K. T. Sundara Raja Iyengar and S. Anatharamu, 141
General Computer Analysis of Beams, John E. Goldberg, John L. Bogdanoff, and William D. Glauz, 80
Generation of Artificial Earthquakes, G. W. Housner and P. C. Jennings, 530

ENGINEERING MECHANICS Continued
Lamella Beams and Grids, Donald L. Dean, 255
Limit Analysis of Circular Orthotropic Plates, Toshio Mura, Jao-Shiun Kao, and Seng-Lip Lee, 607
Linear Strain Hardening of Cylindrical Shells, B. J. Thorn and S. L. Lee, 752
Load-Deformation Behavior of Shells of Revolution, Steven C. Batterman, 704
Lumping of Mass in Calculation Vibration Response, V. H. Neubert, 219
Membrane Stresses in Laminated Anisotropic Shells, Stanley B. Dong, 228
Minimum Weight Plastic Design of Continuous Frames, Donald A. Sawyer and Linton E. Grinter, 711
Numerical Method for Structural Shock Response, G. J. O'Hara and Patrick F. Cuniff, 169
On a Kind of Hysteretic Damping, Emilio Rosenblueth and Ismael Herrera, 521
Orthotropic Beams Under Polynominal Loads, Isadore K. Silverman, 634
Parametric Expansions for Oval Reinforced Rings, William P. Vafakos and Neil Nissel, 577
Periodic Response of a General Yielding Structure, Paul C. Jennings, 121
Plastic Analysis of Orthotropic Circular Plates, Joel Markowitz and Ling-Wen Hu, 639
Pressure Generated by Cavitation in a Pipe, Wen-Hsiung Li and James P. Walsh, 789
Relief of Residual Stresses by Heating Patterns, T. H. Lin and Leslie M. Lackman, 675
Resonance Testing of Full-Scale Structures, Donald E. Hudson, 655
Response of Elastic Cylinders to Plane Shear Waves, Lawrence J. Mente and Francis W. French, 681
Rigidity and Strength of Composite Plates, C. W. Beadle, J. W. Dally and W. F. Riley, 777
Seismic Analysis of Bridges on Long Piles, Joseph Penzien, Charles F. Scheffey, and Richard A. Parmelee, 321
Series Solution of Skewed Plates, J. B. Kennedy and M. W. Huggins, 308
Solution of Buckling Problems by Reduction Method, P. Shuleshko, 315
Stresses at Tunnel Intersections, William F. Riley, 615
Stresses in a Layered Half-Plane, K. T. Sundara Raja Iyengar and R. S. Alwar, 404
Vibrational Transfer from Shear Buildings to Ground, Lyidk, S. Jacobsen, 691
Von Mises Transformation for Boundary Layer Theory, Chieh-Shyang Song, 239

ENGINEERS
A Design for the Future, Annual Address at the Conference, Wallace L. Chadwick, 807
Education for Sanitary Engineers, E. Sherman Chase, 801
Effect of the Space Age on the Engineering Profession, R. W. Johnson, 247
Interdisciplinary Education for Urban Planning, Harold L. Michael, 797
Professional Development-The Student's Responsibility, James R. Wright, 793
Some Ethical Implications of Professional Planning, James M. Abernathey, 803
The Composition of the Engineering Profession, William H. Wisely, 533
Surveyors' Footsteps, W. C. Wattles, 208

ENVIRONMENTAL ENGINEERING
Digital Computers and Environmental Control, Gordon P. Fisher and Walter R. Lynn, 334
Environmental Behavior of Nuclear Debris, Conrad P. Straub, Melvin W. Carter, and Dade W. Moeller, 764
How a Waterway Improvement Changed Environment, Robert B. Nichols, 641
Roadside Planting in California, W. L. Warren, 373
Sanitary Engineering in Alaska, Amos J. Alter, 145
Sewage Lagoons and Man's Environment, Jerome H. Svore, 409
Surveying and Mapping and Environmental Engineering, William T. Pryor, 631

EPOXY RESINS
Epoxy-Lined Pipe Reduces Cost of San Buenaventura Trunk Sewer, Alvin J. Hotz, Jr., 501

EROSION
Stabilization of Sand Dunes at Vandenberg Air Force Base, John Peters and Joe Sciandrone, 344
Study of Channel Erosion and Sediment Transport, Carl F. Nordin, Jr., 277

ESTUARIES
Mathematical Model for Dissolved Oxygen, Robert V. Thomann, 153

ETHICS
Consulting Engineering in Foreign Countries, E. Montford Fucik, 21
See ASCE (Code of Ethics)
Some Ethical Implications of Professional Planning, James M. Abernathey, 803
The Value of Management in the Construction Industry, H. C. Turner, Jr., 163
Using Engineering to Enslave You, Adolph J. Ackerman, 340

EXCAVATION
Blasting Design Criteria, Marvin Gates, 269
Nuclear Excavation of a Sea-Level Isthmian Canal, Ernest Graves, Jr., 461

EXPLOSIONS
Dynamic Plastic Analysis of Steel Frames, Barry Rawlings, 649

EXPLOSIVES
Blasting Design Criteria, Marvin Gates, 269
New Light on Blasting Vibration Effects, Harold H. White, 252

EXPOSITIONS
A Special Report on the World's Fair, Frank J. Schneller, Jr., 487

FAILURE
Baldwin Hills Dam Failure, Walter E. Jessup, 137
Collapse of Arches Under Repeated Loading, Vicenzo Franciosi, Giuliano Augusti, and Renato Sparacio, 391
Guam Typhoon Tears Out Hospital Windows, Harold V. Ehlers, 337

FALLOUT
Environmental Behavior of Nuclear Debris,

FALLOUT Continued
Conrad P. Straub, Melvin W. Carter, and Dade W. Moeller, 764

FILTERS (Fluid)
Hydraulics of Thin Film Flow, Joseph B. Franzini and Nabil A. Hassan, 23
Mechanics of Inclined Filters in Earth Dams, V. J. Patel, A. V. Gopala Krishnayya, and K. L. Arora, 457

FINANCING
Economics and Finance in Airport Planning, Belford Brown, 488
Interest on Capital Invested in Construction, J. F. Muir and Eugen Ruus, 635
Metropolitan Drainage Planning in Los Angeles County, M. E. Salsbury, 209

FLOOD CONTROL
Flood Plain Management Improves Man's Environment, James E. Goddard, 24
Optimum Design of Multi-Purpose Reservoirs, Warren A. Hall, 762

FLOODS
Flood Plain Management Improves Man's Environment, James E. Goddard, 24
Hydrology of Spillway Design: Introduction, Harvey O. Banks, 287
Hydrology of Spillway Design Floods: Large Structures—Limited Data, Victor A. Koelzer and Marcel Bitoun, 569
Hydrology of Spillway Design: Large Structures—Adequate Data, Franklin F. Snyder, 587
Travel Time of Waves in Backwaters, Andrew L. Simon, 84

FLOORS
Paving Roof Decks and Industrial Floors, Lansing Tuttle, 301

FLUMES
Natural Roughness Effects in Rigid Open Channels, A. G. Mirajgaoker and K. L. N. Charlu, 544
Regime Criteria for Alluvial Streams, R. J. Garde and K. G. Ranga Raju, 178
Temporary Flow Measurement in Sewers and Drains, M. H. Diskin, 299

FOLDED PLATES
Analysis of Folded Plate Structures, George G. Goble, 387
Analysis of Short Span Folded Plates, Kaveti Seetharamulu and Mangesh G. Kulkarni, 699

FOOTINGS
Dissipation of Elastic Wave Energy in Granular Soils, John R. Hall, Jr., and Frank E. Richart, Jr., 663

FORECASTING
Forecasting Airport Traffic, Norman L. Johnson, 665

FOREIGN ENGINEERING
A Tunnel Favored for English Channel Crossing, John O. Bickel, 304
Belgian 223-Ft Barge Lift Keeps Vessels Afloat on Inclined Railway, Hal W. Hunt and J. K. Huckerby, 715
Bridges on Stockholm Motorway, S. Lund, 731
Coastal Engineering in Japan, R. L. Wiegel and Kiyoshi Horikawa, 719
Consulting Engineering in Foreign Countries, E. Montford Fucik, 21
Engineered Construction in Sweden, Hal W. Hunt, 708
Ghana's Akosombo Dam—Design and Construction, R. P. Ware and D. R. Hooper, 735
Unit Prices Around the World, ASCE Construction Division Committee Report, 362

FORMWORK (Construction)
Slipforming a Chimney 450 Ft High in Nottingham, Ole Wewer, 739

FOUNDATIONS
Box-Type Mat Solves Foundation Problem for Syracuse Housing Project, Francis A. Hahn, 297
Dissipation of Elastic Wave Energy in Granular Soils, John R. Hall, Jr., and Frank E. Richart, Jr., 663
Fill Settlement Despite Vertical Sand Drains, George F. Sowers, 685
Foundation Behavior of Iron Ore Storage Yards, Ralph B. Peck and Tonis Raamot, 783
Foundation Modulus Tests for Karadj Arch Dam, W. A. Waldorf, J. A. Veltrop, and J. J. Curtis, 271
Golden Gateway (Symposium): M. Justin Herman, William W. Moore, Stanley E. Teixeira, Don Gillis, 17
Load Transfer in a Step-Taper Pile, Elio D'Appolonia and John A. Hribar, 353
New Tainter Gate Hoist, H. Spencer Green, 266
Old Method with New Twist Solves Bank Shoring Problem, Howard R. Gould, 105
Pressure Cell Observations—Garrison Dam Project, H. A. Sikso and C. V. Johnson, 653
Rebound in Redesign of Oahe Dam Hydraulic Structures, Lloyd B. Underwood, Stanley T. Thorfinnson, and William T. Black, 47
Seismic Analysis of Bridges on Long Piles, Joseph Penzien, Charles F. Scheffey, and Richard A. Parmelee,321
Settlement Response Caused by Footing Groups, Raymond J. Krizek and Robert L. Kondner, 659
Variable-Factors Theory of Bearing Capacity, George C. Y. Hu, 291
Vibration of Gas Compressor Foundation Controlled by Chemical Grouting, Gregory P. Tschebotarioff, 253

FRAMES
Constant Shear Moment Distribution, Michael Jordan, 34
Design of Haunched Beams by Fixed Points, Stanton E. Huey, 613
Dynamic Analysis of Elastic-Plastic Frames, Arthur C. Heidebrecht, Seng-Lip Lee, and John F. Fleming, 33
Eigen-Matrix Method for Beams and Plates, Bennosuke Tanimoto, 103
Elastic and Inelastic Buckling of Portal Frames, Kuang-Han Chu and Algis Pabarcius, 773
Elastic Buckling of Rigidly-Jointed Braced Frames, S. J. Britvec and A. H. Chilver, 173

FRAMES Continued
Iterative Limit Load Analysis for Tall Frames, Niels C. Lind, 661
Limit Analysis of Grid Frameworks, F. S. Shaw, 330
Matrix Analysis of Semi-Rigidly Connected Frames, G. R. Monforton and T. S. Wu, 149
Minimum Weight Plastic Design of Continuous Frames, Donald A. Sawyer and Linton E. Grinter, 711
Moment Coefficients for Frame Analysis, Frederick P. Wiesinger, Seng-Lip Lee and John F. Fleming, 39
Moment Equations for Computer Analysis of Frames, Semih S. Tezcan, 673
Nonlinear Behavior of Structural Plane Frames, S. A. Saafan, 197
Preliminary Analysis of Continuous Curved Girder Frames, Delbert C. Carman and Jan J. Tuma, 642
Pressure Testing of Thick Reinforced Concrete Cell, Stanley H. Fistedis, 324
Structural Analysis of Multistory Buildings, Ray W. Clough, Ian P. King, and Edward L. Wilson, 729
Zero Sidesway Axis of Rigid Frames, A. J. Celis and P. Glockner, 19

FRICTION
Shearing Resistance of Soils as a Rate Process, James K. Mitchell, 369

FUEL
Airplane Fuel—From Barge to Plane, 478

GATES
Navigation Locks: Navigation Lock Gates and Valves, George C. Richardson, 394
New Tainter Gate Hoist, H. Spencer Green, 266
Prestressed Anchorage for Large Tainter Gate, Andrew Eberhardt and Jan A. Veltrop, 757

GEODESY
Vertical Gradient of Gravity, Ivan I. Mueller, 235

GEOLOGY
Land Subsidence Problems, Raymond F. Dawson, 206
Rebound in Redesign of Oahe Dam Hydraulic Structures, Lloyd B. Underwood, Stanley T. Thorfinnson, and William T. Black, 47
Retreat of Lakeshore Bluffs, Howard J. Pincus, 343
Vaiont Reservoir Disaster, George A. Kiersch, 155

GIRDER BRIDGES
Welded Bridge Girders, Omer W. Blodgett, 27

GIRDERS
Plastic Analysis of Circular Balcony Girders, Kuang-Han Chu and Arthur Thelen, 62
Preliminary Analysis of Continuous Curved Girder Frames, Delbert C. Carman and Jan J. Tuma, 642
Welded Construcctional Alloy Plate Girders, P. B. Cooper, H. S. Lew, and B. T. Yen, 123

GOVERNMENT
Professional Development, the Younger Viewpoint (Symposium)—In Public Practice, Victor F. Jelen, 283

GOVERNMENT AGENCIES
Unit Prices Around the World, ASCE Construction Division Committee Report, 362

GROUND WATER
Ground-Water Management for the Nation's Future—Effecting Optimum Ground-Water Basin Management, Vernon E. Valentine, 733
Ground-Water Management for the Nation's Future—Optimum Conjunctive Operation of Ground-Water Basins, Robert Y. D. Chun, Lewis R. Mitchell, and Kiyoshi W. Mido, 355
Ground-Water Management for the Nation's Future—Water Resources Management Through Ground-Water Basin Operation, Lloyd C. Fowler, 725
Hydrogeologic Electric Analog Computer, William C. Walton and Thomas A. Prickett, 43
Plastic Surgery on Irrigation Areas, Kent S. Ehrman, 29
Supplement to Petersons's Design of Replenishment Wells, Mahdi S. Hantush, 101
The Law of the Underground, James H. Krieger, 167
Unsaturated Flow in Ground Water Hydraulics, Herman Bouwer, 593
Whittier Narrows Water Reclamation Plant, John D. Parkhurst and Walter E. Garrison, 499

GROUTING
Concept of Curtain Grouting Evaluation, Leland F. Grant, 349
Vibration of Gas Compressor Foundation Controlled by Chemical Grouting, Gregory P. Tschebotarioff, 253

GUY WIRES
Deflection of Tall Guyed Tower in Dallas, J. K. Groseclose, 571

HARBOR FACILITIES
Alternate Design Proves Economy of Precast Prestressed Design for Seattle Pier Shed, Wheeler H. Rucker, Jr., 231
The Bow Mooring for Berthing Tankers, Leonard E. Van Houten and G. A. McCammon, 125

HARBORS
Rubble-Mound Breakwater Design for Refuge Harbor, John R. Hyland, 597
Small-Craft Harbor Problems, Charles E. Lee, 647
The Drydock Lock, James R. Ayers, Arden L. Burnett, and Ralph C. Stokes, 471

HELICOPTERS
Increasing the Efficiency of Helicopters on Transmission-Line Construction, E. S. Zobel and R. A. Kravitz, 489

HIGHWAYS
Analytical Methods in Transportation: Digital Simulation of Traffic, Aaron Glickstein, 498
Analytic Methods in Transportation: Mathematical Car-Following Theory of Traffic Flow,

HIGHWAYS Continued
Denos C. Gazis, Robert Herman, and Richard W. Rothery, 78
Bridges on Stockholm Motorway, S. Lund, 731
Driveway Approaches Designed for Automobile Access, Albert W. Huelsman, 261
Electronic Guidance for Highway Safety, John J. O'Mara, 519
Evaluating Urban Transportation Systems, George Haikalis and E. Wilson Campbell, 479
Expressway Maintenance: Costs and Problems in Urban Areas, C. H. Lang, 317
New Ways to See Land Use and Transportation, J. Douglas Carroll, Jr., 365
Oregon Sets the Pace on the Interstate, Carl S. Larson, 196
Photogrammetry and Highway Law, Morris M. Abrams, 191
Problems of Off-Road Transportation, Louis J. Goodman and Ronald A. Liston, 53
Roadside Planting in California, W. L. Warren, 373
Roadway Lighting, Thomas J. Sebrun, 442
Use of Surcharges in Highway Construction, William F. Kleiman, 623

HOISTS
Roll-Ramp Lifting Device for Fishway at Priest Rapids Dam, W. R. Martin, 535

HOUSING
Box-Type Mat Solves Foundation Problem for Syracuse Housing Project, Francis A. Hahn, 297

HYDRAULIC JUMP
Hydraulic Jump in All Shapes of Horizontal Channels, R. Silvester, 75

HYDRAULICS
Accelerated Motion of a Sphere in a Viscous Fluid, Lucien M. Brush, Hau-Wong Ho, and Ben-Chie Yen, 541
An Electric-Powered Vehicle for Large River Measurements, H. H. Stevens, Jr., and G. R. Dempster, Jr., 480
Characteristics of the Backwater Curve, Harold R. Vallentine, 755
Construction Finishes and High-Velocity Flow, James W. Ball, 382
Control Structures for Sand-Bed Channels, Frederick C. Stepanich, Daryl B. Simons, and Everett V. Richardson, 485
Design Hydrographs for Small Watersheds in Indiana, I-Pai Wu, 119
Development of a Solid-Liquid Flow Meter, Norbert L. Ackerman and Chaleo Niyomthai, 381
Disintegration of a Turbulent Water Jet, Tsu-Fang Chen and John R. Davis, 97
Domain Variations in Channel Seepage Flow, Hubert J. Morel-Seytoux, 176
Efficiency of Pumping from Small Circular Sumps, Ali M. Shahroody and John R. Davis, 339
End Depth for Circular Channels, N. Rajaratnam and D. Muralidhar, 407
End Depth for Exponential Channels, N. Rajaratnam and D. Muralidhar, 765
Flow Measurement with a Suspension Wire, Bruce B. Sharp, 467
Form-Induced Hydraulic Forces on Three-Leaf Intake Gates, Rex A. Elder and Jack M. Garrison, 771
Geometry of River Channels, Walter B. Langbein, 679
Ground-Water Management for the Nation's Future—Computer Simulation of Ground-Water Basins, Howell N. Tyson and Ernest M. Weber, 760
Ground-Water Management for the Nation's Future—Effecting Optimum Ground-Water Basin Management, Vernon E. Valentine, 733
Ground-Water Management for the Nation's Future—Optimum Conjunctive Operation of Ground-Water Basins, Robert Y. D. Chun, Lewis R. Mitchell, and Kiyoshi W. Mido, 355
Ground-Water Management for the Nation's Future—Water Resources Management Through Ground-Water Basin Operation, Lloyd C. Fowler, 725
Hydraulic Aspects of Arkansas River Stabilization, Margaret S. Petersen, 625
Hydraulic Downpull on Ice Harbor Powerhouse Gate, Peter M. Smith, 574
Hydraulic Jump in All Shapes of Horizontal Channels, R. Silvester, 75
Hydraulics of Thin Film Flow, Joseph B. Franzini and Nabil A. Hassan, 23
Hydrodynamic Analysis for High-Head Leaf Gates, Eduard Naudascher, Helmut E. Kobus, and Ragam Panda R. Rao, 746
Hydrogeologic Electric Analog Computer, William C. Walton and Thomas A. Prickett, 43
Hydrology of Spillway Design: Introduction, Harvey O. Banks, 287
Hydrology of Spillway Design: Large Structures-Adequate Data, Franklin F. Snyder, 587
Hydrology of Spillway Design Floods: Large Structures—Limited Data, Victor A. Koelzer and Marcel Bitoun, 569
Hydrology of Spillway Design: Small Structures—Limited Data, Harold O. Ogrosky, 367
Lost River System-A Water Quality Management Study, Gerald T. Orlob and Philip C. Woods, 87
Mathematical Model for Transient River Flow, Eivind Kindingstad, 682
Natural Roughness Effects in Rigid Open Channels, A. G. Mirajgaoker and K. L. N. Charlu, 544
Navigation Locks: Filling and Emptying Systems for Locks, Martin E. Nelson and Harvey J. Johnson, 398
Navigation Locks: Navigation Lock Gates and Valves, George C. Richardson, 394
Nonlinear Instantaneous Unit-Hydrograph Theory, Krishan Piara Singh, 497
Optimum Design of Multi-Purpose Reservoirs, Warren A. Hall, 762
Pneumatic Reduction of Salt Intrusion Through Locks, G. Abraham and P. Vander Burgh, 166
Practical Computations of Bed-Material Discharge, Bruce R. Colby, 383
Practical Results of Hydraulics Research: Hydraulics Division Committee on Research Reports, Harold M. Martin, Chmn., 347
Ratio of True to Fixed-Interval Maximum Rainfall, Leonard L. Weiss, 66
Rebound in Redesign of Oahe Dam Hydraulic Structures, Lloyd B. Underwood, Stanley T.

HYDRAULICS Continued
Thorfinnson, and William T. Black, 47
Regime Criteria for Alluvial Streams, R. J. Garde and K. G. Ranga Raju, 178
Regulation of the Caspian Sea, Otakar W. Kabelac, 609
Resistance of Cylindrical Piers in Open-Channel Flow, Tsuying Hsieh, 657
Sand Transport Studies with Radioactive Tracers, D. W. Hubbell and William W. Sayre, 619
Sediment Investigations—Middle Rio Grande, Ernest L. Pemberton, 187
Shapes for Appurtenances in Stilling Basins, Narayana N. Pillai and T. E. Unny, 643
Shear and Velocity Distribution in Shallow Channels, H. Lundgren and Ivar G. Jonsson, 693
Simple Dimensional Method for Hydraulic Problems, Richard B. Whittington, 135
Study of Channel Erosion and Sediment Transport, Carl F. Nordin, Jr., 277
Study of Sediment Ripple Formation, A. J. Raudkivi, 110
Tapered Inlets for Pipe Culverts, John L. French, 375
Temporary Flow Measurement in Sewers and Drains, M. H. Diskin, 299
The Drydock Lock, James R. Ayers, Arden L. Burnett, and Ralph C. Stokes, 471
Time of Travel of Soluble Contaminants in Streams, Thomas J. Buchanan, 669
Transitions for Canals and Culverts, William P. Simmons, 35
Travel Time of Waves in Backwaters, Andrew L. Simon, 84
Two-Dimensional Flow Over Sills in Open Channels, Gary Z. Watters and Robert L. Street, 766
Two-Dimensional Jet and Cavity Flows, Robert L. Street, 113
Unsaturated Flow in Ground Water Hydraulics, Herman Bouwer, 593
Velocity of a Water-Hammer Wave in an Elastic Pipe, A. R. Halliwell, 1
Waterhammer Analysis of Pipelines, Victor L. Streeter, 591
Water Jet Pump, N. H. G. Mueller, 311
Wave Breakers on a Beach and Surges on a Dry Bed, J. C. Freeman and Bernard Le Mehauté, 759
Weather Modification, Richard A. Schleusener, 199

HYDRODYNAMICS
Accelerated Motion of a Sphere in a Viscous Fluid, Lucien M. Brush, Hau-Wong Ho and Ben-Chie Yen, 541
Hydrodynamic Analysis for High-Head Leaf Gates, Eduard Naudascher, Helmut E. Kobus, and Ragam Panda R. Rao, 746
Seepage from Parallel Trapezoidal Channels, Ahmed El Nimr, 127
Study of Sediment Ripple Formation, A. J. Raudkivi, 110
Two-Dimensional Flow Over Sills in Open Channels, Gary Z. Watters and Robert L. Street, 766

HYDROELECTRIC POWER GENERATION
Design and Performance of Mammoth Pool Power Tunnel, Bruce R. Laverty and Klaus R. Ludwig, 416

HYDROLOGY
Design Hydrographs for Small Watersheds in Indiana, I-Pai Wu, 119
Hydrology of Spillway Design: Introduction, Harvey O. Banks, 287
Hydrology of Spillway Design: Large Structures—Adequate Data, Franklin F. Snyder, 587
Hydrology of Spillway Design: Large Structures—Limited Data, Victor A. Koelzer and Marcel Bitoun, 569
Hydrology of Spillway Design: Small Structures—Limited Data, Harold O. Ogrosky, 367
Irrigation Development in a Subhumid Area, Arthur D. Soderberg, 640
Lost River System - A Water Quality Management Study, Gerald T. Orlob and Philip C. Woods, 87
Nonlinear Instantaneous Unit-Hydrograph Theory, Krishan Piara Singh, 497
Supplement to Peterson's Design of Replenishment Wells, Mahdi S. Hantush, 101

ILLINOIS
Analysis of Master Plan for Chicago O'Hare Airport, Martin A. Warskow and Howard C. Burns, 63

ILLUMINATION
Roadway Lighting, Thomas J. Sebrun, 442

IMPACT
Dynamic Plastic Analysis of Steel Frames, Barry Rawlings, 649

INCINERATION
Incineration (Symposium): Lenard S. Wegman, Junius W. Stephenson, Robert L. Stenburg, Harold G. Meissner, 491

INDEXES (Locators)
Inventory Index Proposed for Testing Apparatus, M. D. Morris, 331

INDUSTRIAL ENGINEERING
Professional Development, the Younger Viewpoint (Symposium)—In Industry, Richard W. Shute, 285

INSPECTION
The New Welding Code for Buildings, Arsham Amirikian, 396

INSTRUMENTATION
Yellowtail Dam on Big Horn River, Instrumented for Structural Behavior Studies, Keith Jones, 567

INSURANCE
As a Contractor, Do You Carry Adequate Insurance? James Midwinter, 371

IRRIGATION
Analysis of Precipitation at Huntington Lake, Stanley M. Barnes, 469
An Experiment on Flow Through Smooth Tile Joints, A. F. Pillsbury, E. H. Taylor, R. W. Pelishek, and J. F. Osborn, 455

IRRIGATION Continued
Design of Tile Drainage for Arid Regions, Hammad Y. Hammad, 749
Desirable Features of Water Rights Laws, Dan S. Jones, Jr., 512
Effective Rainfall and Irrigation Water Requirements, David M. Hershfield, 741
Efficiency of Pumping from Small Circular Sumps, Ali M. Shahroody and John R. Davis, 339
End Depth for Exponential Channels, N. Rajaratnam and D. Muralidhar, 765
Estimating Evapotranspiration from Solar Radiation, Marvin E. Jensen and Howard R. Haise, 107
Indus-Valley—West Pakistan's Life Line, Alexander Karpov, 509
Irrigation Development in a Subhumid Area, Arthur D. Soderberg, 640
Lost River System—A Water Quality Management Study, Gerald T. Orlob and Philip C. Woods, 87
Plastic Surgery on Irrigation Areas, Kent S. Ehrman, 29
Seepage from Parallel Trapezoidal Channels, Ahmed El Nimr, 127
Separation of Evapotranspiration and Deep Percolation, Lyman S. Willardson and Wendell L. Pope, 56
Study of Municipal and Irrigation Water Shortages, C. B. Thompson, 446
Supplement to Peterson's Design of Replenishment Wells, Mahdi S. Hantush, 101
Water Quality Changes in Elephant Butte Reservoir, John H. Bliss, 57
Water Right Engineering Under Appropriation System, Kenneth R. Wright, 280

JOINTS
An Experiment on Flow Through Smooth Tile Joints, A. F. Pillsbury, E. H. Taylor, R. W. Pelishek, and J. F. Osborn, 455
Fatigue of Joints in Aluminum Alloy 6061-T6, Glenn E. Nordmark and John W. Clark, 744
History and Development of Concrete Pavement Design, Gordon K. Ray, 91

LABORATORIES
Inventory Index Proposed for Testing Apparatus, M. D. Morris, 331

LAKES
A Lake's Response to Its Environment, Robert O. Sylvester and George C. Anderson, 11

LANDSLIDES
Slope Stabilized by Anchored Retaining Wall, G. A. Reti, 216

LEGISLATION
Air Pollution Control in New York State, Alexander Rihm, 89
ASCE Activity in Public Affairs, William H. Wisely, 351
Desirable Features of Water Rights Laws, Dan S. Jones, Jr., 512
Ground-Water Management for the Nation's Future—Effecting Optimum Ground-Water Basin Management, Vernon E. Valentine, 733
Photogrammetry and Highway Law, Morris M. Abrams, 191
The Law of the Underground, James H. Krieger, 167

LIFTS
Roll-Ramp Lifting Device for Fishway at Priest Rapids Dam, W. R. Martin, 535

LIMIT-DESIGN METHOD (Structural)
Limit Analysis of Circular Orthotropic Plates, Toshio Mura, Jao-Shiun Kao, and Seng-Lip Lee, 607
Limit Design of Reinforced Concrete Slabs, Robert E. Crawford, 768

LOADS (Forces)
Buckling Loads for Stepped Columns, John W. Harvey, 618
Dynamic Similitude of Underground Structures, Donald F. Young and Glenn Murphy, 439
Experiments on Stability on Spherical Caps, Ta-Cheng Loo and Ross M. Evan-Iwanowski, 69
Gravity Flow Reinforced Concrete Pipe Design, Howard F. Peckworth and John G. Hendrickson, 584
Load Transfer in a Step-Taper Pile, Elio D'Appolonia and John A. Hribar, 353
Philosophy of Engineering Design of Structures, Malcolm S. Gregory, 59
Plastic Analysis of Circular Balcony Girders, Kunag-Han Chu and Arthur Thelen, 62

LOCKS (Barriers)
Navigation Locks: End Filling and Emptying Systems for Locks, Fred R. Brown, 651
Navigation Locks: Filling and Emptying Systems for Locks, Martin E. Nelson and Harvey J. Johnson, 398
Pneumatic Reduction of Salt Intrusion Through Locks, G. Abraham and P. Vander Burgh, 166
The Drydock Lock, James R. Ayers, Arden L. Burnett, and Ralph C. Stokes, 471

MAINTENANCE
Expressway Maintenance: Costs and Problems in Urban Areas, C. H. Lang, 317

MANAGEMENT
Can the Civil Engineer be a Manager, H. L. Payne, 293
First Five Years of the Critical-Path Method, William J. Gleason, Jr., and Joseph J. Ranieri, 40
Ground-Water Management for the Nation's Future—Effecting Optimum Ground-Water Basin Management, Vernon E. Valentine, 733
PERT and CPM Techniques in Project Management, Restan M. Aras and Julius Surkis, 486
Resident Engineer Responsibility on Construction, Irving Kett, 15
The Value of Management in the Construction Industry, H. C. Turner, Jr., 163

MANPOWER
Manpower by Critical Path Method, John A. Keane and Jack D. Trawick, 288

MAPPING
Daylight Star Observations in Antarctica, Douglas R. Lee, 221
Mapping the World, Hal W. Hunt, 71
Plane Coordinate Systems and Map Projections, Erwin Schmid, 444
Simultaneous Relative Orientation of Multiple Cameras, Houssam M. Karara and Atef A. Elassal, 70

MAPPING Continued
Surveying and Mapping and Environmental Engineering, William T. Pryor, 631

MAPS
Photogrammetry and Highway Law, Morris M. Abrams, 191
Surveys and Maps for Industrial Growth, Earle J. Fennell, 671

MATERIALS
Dissipation of Elastic Wave Energy in Granular Soils, John R. Hall, Jr., and Frank E. Richart, Jr., 663
Quantity Surveys for Cost Estimates, George W. Heller, 333
Structure Designs Governed by Limited Deformations, Jacob Solomon, 477
Subgrade Stabilization Under an Existing Runway, S. Chas. Dearstyne and Gene J. Newman, 215

MATHEMATICS
Analytical Methods in Transportation: Digital Simulation of Traffic, Aaron Glickstein, 498
Analytic Methods in Transportation: Left Turn Penalties in Traffic Assignment Models, Joseph A. Wattleworth and Pul W. Shuldiner, 346
Bending Analysis for Clamped Rectangular Plates, Leonard R. Herrmann, 251
Ground-Water Management for the Nation's Future—Optimum Conjunctive Operation of Ground-Water Basins, Robert Y. D. Chun, Lewis R. Mitchell, and Kiyoshi W. Mido, 355
Mathematical Model for Dissolved Oxygen, Robert V. Thomann, 153
Series Solution of Skewed Plates, J. B. Kennedy and M. W. Huggins, 308
Simple Dimensional Method for Hydraulic Problems, Richard B. Whittington, 135
Spacing of Drains by an Approximate Method, Gedeon Dagan, 81

MATRICES
Constant Shear Moment Distribution, Michael Jordan, 34
General Computer Program for Limit Analysis, Chu-Kia Wang, 161

MEASURING INSTRUMENTS
Deflection of Tall Guyed Tower in Dallas, J. K. Groseclose, 571
Development of a Solid-Liquid Flow Meter, Norbert L. Ackerman and Chaleo Niyomthai, 381
New Techniques for Very Accurate Measurement, Eugene H. Koenig, 358
Time of Travel of Soluble Contaminants in Streams, Thomas J. Buchanan, 669

METEOROLOGY
Ratio of True to Fixed-Interval Maximum Rainfall, Leonard L. Weiss, 66

MIDDLE RIO GRANDE VALLEY
Sediment Investigations—Middle Rio Grande, Ernest L. Pemberton, 187

MILITARY ENGINEERING
Underground NORAD Command Center at Colorado Springs, Theodore O. Blaschke, 237

MISSILES
Environmental Missle Launch Systems, Don J. Wood, 579

MISSOURI RIVER
Rebound in Redesign of Oahe Dam Hydraulic Structures, Lloyd B. Underwood, Stanley T. Thorfinnson, and William T. Black, 47

MODELS
Analytical Methods in Transportation: Digital Simulation of Traffic, Aaron Glickstein, 498
Channel Changes in the St. Clair River Since 1933, Ira M. Korkigian, 5
Dynamic Similitude of Underground Structures, Donald F. Young and Glenn Murphy, 439
Generation of Artificial Earthquakes, G. W. Housner and P. C. Jennings, 530
Ground-Water Management for the Nation's Future—Computer Simulation of Ground-Water Basins, Howell N. Tyson and Ernest M. Weber, 760
Ground-Water Management for the Nation's Future—Optimum Conjunctive Operation of Ground-Water Basins, Robert Y. D. Chun, Lewis R. Mitchell, and Kiyoshi W. Mido, 355
Hydraulic Downpull on Ice Harbor Powerhouse Gate, Peter M. Smith, 574
Hydraulic Jump in All Shapes of Horizontal Channels, R. Silvester, 75
Mathematical Model for Dissolved Oxygen, Robert V. Thomann, 153
Navigation Locks: Navigation Lock Gates and Valves, George C. Richardson, 394
Prestressed Anchorage for Large Tainter Gate, Andrew Eberhardt and Jan A. Veltrop, 757
Simple Dimensional Method for Hydraulic Problems, Richard B. Whittington, 135
Stresses at Tunnel Intersections, William F. Riley, 615

MOMENT DISTRIBUTIONS
Constant Shear Moment Distribution, Michael Jordan, 34

MOMENTS
Influence-Line Spectrum by Graphical Construction, Charles G. Salmon, and Donald R. Buettner, 428
Moment Coefficients for Fixed-End Beams to be Used in the Three-Moment Equation, Thomas D. Y. Fok and Thomas F. Mosure, 449

NAVIGATION
How a Waterway Improvement Changed Environment, Robert B. Nichols, 641
Navigation Locks: Filling and Emptying Systems for Locks, Martin E. Nelson and Harvey J. Johnson, 398
Navigation Locks: TVA's Multiport Lock Filling and Emptying System, Rex A. Elder, James T. Price, and Ward W. Engle, 379
Pneumatic Reduction of Salt Intrusion Through Locks, G. Abraham and P. vander Burgh, 166

NEW MEXICO
Water Quality Changes in Elephant Butte Reservoir, John H. Bliss, 57

NUCLEAR ENERGY
A Sea-Level Canal to Link the Atlantic and the Pacific, Senator Warren G. Magnuson, 405
Nuclear Excavation of a Sea-Level Isthmian Canal, Ernest Graves, Jr., 461
Underground NORAD Command Center at Colorado Springs, Theodore O. Blaschke, 237

OFFSHORE STRUCTURES
The Bow Mooring for Berthing Tankers, Leonard E. Van Houten and G.A. McCammon, 125

ORTHOTROPIC BRIDGES
California Builds Experimental Orthotropic Plate Bridge, Raymond E. Davis and Ostap Bender, 547

PANAMA CANAL
Underwater Inspection of Test Fill in Gatun Lake for Dam to Serve Panama Canal, Anthony P. Mann, 241

PARKING FACILITIES
Trends in Automobile Parking at Airports, Charles A. Lawler, 583
Automobile Parking Requirements at Airports, Wolfgang S. Homburger and William R. Eager, 805

PAVEMENTS
A City Engineer Talks about Paving, Gilbert B. White, 278
Asphalt Paving Equipment, John J. Laing, 475
Oregon Sets the Pace on the Interstate, Carl S. Larson, 196
Paving Roof Decks and Industrial Floors, Lansing Tuttle, 301
Rigid and Stiff Airport Paving, Henry P. Carothers, 791
Soil-Lime Research at Iowa State University, Manuel Mateos, 433
What's New in Concrete Paving, E. C. Lokken, 151

PERMEABILITY
Auxiliary Potential Function for Seepage, Bruce B. Schimming and Robert L. Kondner, 769

PHOTOELASTICITY
Stresses at Tunnel Intersections, William F. Riley, 615

PHOTOGRAMMETRY
Analogue Aerial Triangulation, Herbert S. Williams, 245
Aerial Traverse and Maximum Bridging Distance, Sandor A. Veres, 211
Mapping the World, Hal W. Hunt, 71
Photogrammetry and Highway Law, Morris M. Abrams, 191
Planning and Design of Aerotriangulation Projects, Houssam M. Karara, 424
Simultaneous Relative Orientation of Multiple Cameras, Houssam M. Karara and Atef A. Elassal, 70
Surveying and Mapping and Environmental Engineering, William T. Pryor, 631

PIERS
Pier Extension and Repair at Tallmans Island Sewage Treatment Plant at College Point, Remig A. Papp, 306

PILES AND PILE DRIVING
Analysis of Pile Groups with Flexural Resistance, A. J. Francis, 600
Load Transfer in a Step-Taper Pile, Elio D'Appolonia and John A. Hribar, 353
Prediction of Pile Capacity by the Wave Equation, Paul W. Forehand and Joseph L. Reese, Jr., 399
Seismic Analysis of Bridges on Long Piles, Joseph Penzien, Charles F. Scheffey, and Richard A. Parmelee, 321
The Long Thermopile, Erwin L. Long, 189
Vibratory Driver Successful for Sheetpile Cells, in Erie Harbor, E. W. Boggs, 243

PIPELINES
Analysis of Blast Effects on Pipelines, George M. McClure, Thomas J. Atterbury, and Noah A. Frazier, 603
Arc Lengths and Curvature of Parabolic Segments, Murphy H. Thibodeaux, 622
Design of Flexible Steel Pipe Under External Loads, Walter H. Cates, 599

PIPES
Gravity Flow Reinforced Concrete Pipe Design, Howard F. Peckworth and John G. Hendrickson, 584
Prestressed-Concrete Water Line Laid near Fresno at Rate of 200 ft Per Hour, John S. Miller, 195
Velocity of a Water-Hammer Wave in an Elastic Pipe, A. R. Halliwell, 1
Waterhammer Analysis of Pipelines, Victor L. Streeter, 591
Gravity Flow Reinforced Concrete Pipe Design, Howard F. Peckworth and John G. Hendrickson, 584
Low Pressure Air Test for Sanitary Sewers, Roy E. Ramseier and George C. Riek, 677

PLANNING
Economics and Finance in Airport Planning, Belford Brown, 488
Photogrammetry and Highway Law, Morris M. Abrams, 191
Planning and Design of Aerotriangulation Projects, Houssam M. Karara, 424
Population Forecasting by Sanitary Engineers, Frederick E. McJunkin, 782
Surveys and Maps for Industrial Growth, Earle J. Fennell, 671
Using Engineering to Enslave You, Adolph J. Ackerman, 340

PLASTICITY
Buckling of Steel Columns Under Arbitrary End Loads, Seng-Lip Lee and G. F. Hauck, 73
Circular Plates Loaded into the Plastic Region, Leslie M. Lackman, 787
Collapse of Arches Under Repeated Loading, Vicenzo Franciosi, Giuliano Augusti, and Renato Sparcio, 391
Dynamic Analysis of Elastic-Plastic Frames, Arthur C. Heidebrecht, Seng-Lip Lee, and John F. Fleming, 33
Iterative Limit Load Analysis for Tall Frames, Niels C. Lind, 661

PLASTICITY Continued
Minimum Weight Plastic Design of Continuous Frames, Donald A. Sawyer and Linton E. Grinter, 711
Plastic Analysis of Circular Balcony Griders, Kuang-Han Chu and Arthur Thelen, 62
Relief of Residual Stresses by Heating Patterns, T. H. Lin and Leslie M. Lackman, 675
Test of Cylindrical Shells in the Plastic Range, Giuliano Augusti and Salvatore d'Agostino, 335

PLATES (Structural Members)
Analysis of Composite Beam Bridges by Orthotropic Plate Theory, Vilis Vitols, Rodney J. Clifton, and Tung Au, 3
Analysis of Orthotropic Plate Bridges, Rodney J. Clifton, Jerry C. L. Chang, and Tung Au, 139
Bending Analysis for Clamped Rectangular Plates, Leonard R. Herrmann, 251
Circular Plates Loaded into the Plastic Region, Leslie M. Lackman, 787
Development of Boundary Layers in Buckled Plates, Ernest F. Masur and C. H. Chang, 67
Direct Stiffness Solution for Folded Plates, Arnim DeFries-Skene and A. C. Scordelis, 717
Direct Stress Analysis of Orthtropic Bridge Slabs, Alexander Coull, 13
Eigen-Matrix Method for Beams and Plates, Bennosuke Tanimoto, 103
Limit Analysis of Circular Orthotropic Plates, Toshio Maura, Jao-Shiun Kao, and Seng-Lip Lee, 607
Numerical Methods in Bending and Buckling of Plates, A. N. Sherbourne, 51
Plastic Analysis of Orthotropic Circular Plates, Joel Markowitz and Ling-Wen Hu, 630
Relief of Residual Stresses by Heating Patterns, T. H. Lin and Leslie M. Lackman, 675
Rigidity and Strength of Composite Plates, C. W. Beadle, J. W. Dally and W. F. Riley, 777
Series Solution of Skewed Plates, J. B. Kennedy and M. W. Huggins, 308
Shear of Thin Plates with Flexible Edge Members, Eric R. Bryan and Wagih M. El-Dakhakhni, 289
Solution of Buckling Problems by Reduction Method, P. Shuleshko, 315
Welded Constructional Alloy Plate Girders, P. B. Cooper, H. S. Lew, and B. T. Yen, 123

POPULATION (Statistical)
Population Forecasting by Sanitary Engineers, Frederick E. McJunkin, 782

POWER
Design and Performance of Mammoth Pool Power Tunnel, Bruce R. Laverty and Klaus R. Ludwig, 416
Interest on Capital Invested in Construction, J. F. Muir and Eugen Ruus, 635

POWER PLANTS
Hydraulic Downpull on Ice Harbor Powerhouse Gate, Peter M. Smith, 574

PRACTICE OF ENGINEERING
The Composition of the Engineering Profession, William H. Wisely, 533

PRECAST CONCRETE
Pier Extension and Repair at Tallmans Island Sewage Treatment Plant at College Point, Remig A. Papp, 306
Precast Segmental Construction for Long-span Bridges, Ben C. Gerwick, 44
Precast T's and Slabs Make Culverts Quickly, John F. Lenard, 431

PRESTRESSED CONCRETE
Analysis of Folded Plate Structures, George G. Goble, 387
Precast Segmental Construction for Long-span Bridges, Ben C. Gerwick, 44
The Additional Cooper River Bridge, Frederick H. Sterbenz, 513

PRESTRESSING
Buckling of a Prestressed Circular Ring, John E. Goldberg and John L. Bogdanoff, 767
Prestressed Anchorage for Large Tainter Gate, Andrew Eberhardt and Jan A. Veltrop, 757
Stress Analysis of Prestressed Suspended Roofs, Avinadav Siev and J. Eidelman, 518

PROFESSIONAL ADVANCEMENT
Can the Civil Engineer be a Manager, H. L. Payne, 293
Professional Development, the Younger Viewpoint (Symposium): In Public Practice, Victor F. Jelen, In Private Practice, Harold L. Loyd, In Teaching, Russel C. Jones, In Industry, Richard M. Shute, 283
Profile of a Successful Career, William H. Wisely, 129
The Scope of Civil Engineering, Charles L. Miller, 385
Using Engineering to Enslave You, Adolph J. Ackerman, 340

PROFESSIONAL PRACTICE
Consulting Engineering in Foreign Countries, E. Montford Fucik, 21
Digital Computers and Environmental Control, Gordon P. Fisher and Walter R. Lynn, 344
Education for Sanitary Engineers, E. Sherman Chase, 801
Effect of the Space Age on the Engineering Profession, R. W. Johnson, 247
Interdisciplinary Education for Urban Planning, Harold L. Michael, 797
Professional Development-The Student's Responsibility, James R. Wright, 793
Some Ethical Implications of Professional Planning, James M. Abernathey, 803
Starting a Consulting Business, Joseph S. Ward, 7

PUBLIC HEALTH
Air Pollution Control in New York State, Alexander Rihm, 89

PUMPING
Efficiency of Pumping from Small Circular Sumps, Ali M. Shahroody and John R. Davis, 339

PUMPS
Efficiency of Pumping from Small Circular Sumps, Ali M. Shahroody and John R. Davis, 339

PUMPS Continued
The Drydock Lock, James R. Ayers, Arden L. Burnett, and Ralph C. Stokes, 471
Waterhammer Analysis of Pipeline, Victor L. Streeter, 591
Water Jet Pump, N. H. G. Mueller, 311

RADIOACTIVITY
Action Guides for Radioactive Effluents from PRTR, Richard F. Foster, George E. Blackman, Norman C. Wittenbrock, and John M. Skarpelos, 41
Heat Generation by Radioactive Wastes, Earnest F. Gloyna, H. J. Longley, and C. W. Christenson, 636

RAINFALL
Analysis of Precipitation at Huntington Lake, Stanley M. Barnes, 469
Effective Rainfall and Irrigation Water Requirements, David M. Hershfield, 741
Ratio of True to Fixed-Interval Maximum Rainfall, Leonard L. Weiss, 66
Weather Modification, Richard A. Schleusener, 199

RAPID TRANSIT
Designing the San Francisco Bay Area Rapid Transit System, William A. Bugge, Leslie Irvin, 559
User Criteria for Rapid Transit Planning, Paul J. Claffey, 360

REACTORS
Action Guides for Radioactive Effluents from PRTR, Richard F. Foster, George E. Blackman, Norman C. Wittenbrock, and John M. Skarpelos, 41

RECREATIONAL FACILITIES
A Lake's Response to Its Environment, Robert O. Sylvester and George C. Anderson, 11
How a Waterway Improvement Changed Environment, Robert B. Nichols, 641

REINFORCED CONCRETE
Error Statistics for Reinforced Concrete Beams, Theodore Zsutty, 158
Gravity Flow Reinforced Concrete Pipe Design, Howard F. Peckworth and John G. Hendrickson, 584
Limit Design of Reinforced Concrete Slabs, Robert E. Crawford, 768
Pier Extension and Repair at Tallmans Island Sewage Treatment Plant at College Point, Remig A. Papp, 306
Pressure Testing of Thick Reinforced Concrete Cell, Stanley H. Fistedis, 324
Regression Analysis of Reinforced Concrete Columns, Haresh C. Shah, 345
Slipforming a Chimney 450 Ft High in Nottingham, Ole Wewer, 739
Temperature Stresses in Tall Reinforced Concrete Buildings, Paul Weidlinger, 377

REINFORCEMENT
Reinforcement Requirements for Girder Web Openings, Edmund P. Segner, Jr., 645

RESEARCH
Analytical Methods in Transportation: Digital Simulation of Traffic, Aaron Glickstein, 498
Current Lunar Soil Research, James K. Mitchell, 390
Practical Results of Hydraulics Research: Hydraulics Division Committee on Research Reports, Harold M. Martin, Chmn, 347
Report on Engineering Foundation's Research Conference of Urban Transportation, 201
Weather Modification, Richard A. Schleusener, 199

RESERVOIRS
Baldwin Hills Dam Failure, Walter E. Jessup, 137
Optimum Design of Multi-Purpose Reservoirs, Warren A. Hall, 762
Study of Municipal and Irrigation Water Shortages, C. B. Thompson, 446
Underwater Inspection of Test Fill in Gatun Lake for Dam to Serve Panama Canal, Anthony P. Mann, 241
Vaiont Reservoir Disaster, George A. Kiersch, 155
Water Quality Changes in Elephant Butte Reservoir, John H. Bliss, 57

RETAINING WALLS
Slope Stabilized by Anchored Retaining Wall, G. A. Reti, 216

RIVERS
An Electric-Powered Vehicle for Large River Measurements, H. H. Stevens, Jr., and G. R. Dempster, Jr., 480
How a Waterway Improvement Changed Environment, Robert B. Nichols, 641
Hydraulic Aspects of Arkansas River Stabilization, Margaret S. Petersen, 625
Indus-Valley—West Pakistan's Life Line, Alexander Karpov, 509
Mathematical Model for Transient River Flow, Eivind Kindingstad, 682

ROCK (Material)
Design and Performance of Mammoth Pool Power Tunnel, Bruce R. Laverty and Klaus R. Ludwig, 416
Foundation Modulus Tests for Karadj Arch Dam, W. A. Waldorf, J. A. Veltrop, and J. J. Curtis, 271

ROOFS
Paving Roof Decks and Industrial Floors, Lansing Tuttle, 301
Post-Tensioned Shallow Roof Shells for Syracuse Schools, Walter E. Riley, 421
Stress Analysis of Prestressed Suspended Roofs, Avinadav Siev and J. Eidelman, 518

RUNOFF
Hydrology of Spillway Design: Small Structures—Limited Data, Harold O. Ogrosky, 367

SAFETY
Electronic Guidance for Highway Safety, John J. O'Mara, 519
Error Statistics for Reinforced Concrete Beams, Theodore Zsutty, 158

SAND (Material)
Dissipation of Elastic Wave Energy in Granular Soils, J. R. Hall, Jr., and F. E. Richart, Jr., 663

SAND Continued
Laminar and Turbulent Flow of Water Through Sand, M. Anandakrishnan and G. H. Varadarajulu, 474
Sand Transport Studies with Radioactive Tracers, D. W. Hubbell and William W. Sayre, 619
Stabilization of Sand Dunes at Vandenberg Air Force Base, John Peters and Joe Sciandrone, 344

SANITARY ENGINEERING
Action Guides for Radioactive Effluents from PRTR, Richard F. Foster, George E. Blackman, Norman C. Wittenbrock, and John M. Skarpelos, 41
Air Pollution Control in New York State, Alexander Rihm, 89
A Lake's Response to Its Environment, Robert O. Sylvester and George C. Anderson, 11
Analysis of Sewage Treatment Systems by Simulation, M. Mead Montgomery and Walter R. Lynn, 361
Annual Variation of Stream Water Temperature, J. C. Ward, 258
Application of Acoustics in Air Pollution Problems, Joseph C. F. Chow, 624
Complete Mixing of Activated Sludge—Something for Nothing, Ross E. McKinney, 413
Education for Sanitary Engineers, E. Sherman Chase, 801
Environmental Behavior of Nuclear Debris, Conrad P. Straub, Melvin W. Carter, and Dade W. Moeller, 764
Epoxy-Lined Pipe Reduces Cost of San Buenaventura Trunk Sewer, Alvin J. Hotz, Jr., 501
Equilibria and Capacities for Adsorption on Carbon, Walter J. Weber, Jr. and J. Carrell Morris, 525
Heat Generation by Radioactive Wastes, Earnest F. Gloyna, H. J. Longley, and C. W. Christenson, 636
Kinetics of Aerobic Removal of Organic Wastes, K. Keshavan, V. C. Behn, and W. F. Ames, 770
Low Pressure Air Test for Sanitary Sewers, Roy E. Ramseier and George C. Riek, 677
Machine Tunneling for Storm Sewer Under Houston, W. D. Murphy, 393
Metropolitan Drainage Planning in Los Angeles County, M. E. Salsbury, 209
Minimal Solids Aeration Activated Sludge, M. W. Tenney, R. H. Johnson, Jr., and J. M. Symons, 705
Population Forecasting by Sanitary Engineers, Frederick E. McJunkin, 782
Predictive Techniques for Water Quality-Inorganics, Joe E. Ledbetter and Earnest F. Gloyna, 193
Sanitary Engineering in Alaska, Amos J. Alter, 145
Sewage Lagoons and Man's Environment, Jerome H. Svore, 409
Waste Disposal and the Future at Lake Tahoe, Harvey F. Ludwig, E. Kazmierczak, and Ralf C. Carter, 229
Waste Disposal in Tidal Waters, Alex N. Diachishin, 563
Whittier Narrows Water Reclamation Plant, John D. Parkhurst and Walter E. Garrison, 499

SCHOOLS
Post-Tensioned Shallow Roof Shells for Syracuse Schools, Walter E. Riley, 421

SEDIMENTATION
Accelerated Motion of a Sphere in a Viscous Fluid, Lucien M. Brush, Hau-Wong Ho and Ben-Chie Yen, 541
Practical Computations of Bed-Material Discharge, Bruce R. Colby, 383
Sediment Investigations—Middle Rio Grande, Ernest L. Pemberton, 187
Study of Channel Erosion and Sediment Transport, Carl F. Nordin, Jr., 277

SEDIMENTS
Control Structures for Sand-Bed Channels, Frederick C. Stepanich, Daryl B. Simons, and Everett V. Richardson, 485
Development of a Solid-Liquid Flow Meter, Norbert L. Ackerman and Chaleo Niyomthai, 381
Sand Transport Studies with Radioactive Tracers, D. W. Hubbell and William W. Sayre, 619
Study of Sediment Ripple Formation, A. J. Raudkivi, 110

SEDIMENT TRANSPORT
An Electric-Powered Vehicle for Large River Measurements, H. H. Stevens, Jr., and G. R. Dempster, Jr., 480

SEEPAGE
Auxiliary Potential Function for Seepage, Bruce B. Schimming and Robert L. Kondner, 769
Domain Variations in Channel Seepage Flow, Hubert J. Morel-Seytoux, 176
Plastic Surgery on Irrigation Areas, Kent S. Ehrman, 29
Seepage from Parallel Trapezoidal Channels, Ahmed El Nimr, 127

SETTLEMENT (Structural)
Effect of Preconsolidation on Settlements, Leo Casagrande, 578
Fill Settlement Despite Vertical Sand Drains, George F. Sowers, 685
Land Subsidence Problems, Raymond F. Dawson, 206
Settlement Response Caused by Footing Groups, Raymond J. Krizek and Robert L. Kondner, 659
Stress-Strain Modulus of Clay in Undrained Shear, Charles C. Ladd, 589
Use of Surchanges in Highway Construction, William F. Kleiman, 623

SEWAGE DISPOSAL
Waste Disposal in Tidal Waters, Alex N. Diachishin, 563

SEWAGE TREATMENT
Analysis of Sewage Treatment Systems by Simulation, M. Mead Montgomery and Walter R. Lynn, 361
Complete Mixing of Activated Sludge—Something for Nothing, Ross E. McKinney, 413
Minimal Solids Aeration Activated Sludge, M. W. Tenney, R. H. Johnson, Jr., and J. M. Symons, 705
Sewage Lagoons and Man's Environment, Jerome H. Svore, 409

SEWERS
Epoxy-Lined Pipe Reduces Cost of San Buenaventura Trunk Sewer, Alvin J. Hotz, Jr., 501
Low Pressure Air Test for Sanitary Sewers, Roy E. Ramseier and George C. Riek, 677
Machine Tunneling For Storm Sewer Under Houston, W. D. Murphy, 393
Machine Tunneling in Chicago Clays, Robert S. Mayo, 160
Metropolitan Drainage Planning in Los Angeles County, M. E. Salsbury, 209
Temporary Flow Measurement in Sewers and Drains, M. H. Diskin, 299

SHEAR MODULUS
Problems of Off-Road Transportation, Louis J. Goodman and Ronald A. Liston, 53

SHEAR STRENGTH
Welded Constructional Alloy Plate Girders, P. B. Cooper, H. S. Lew, and B. T. Yen, 123

SHEAR STRESS
Development of Boundary Layers in Buckled Plates, Ernest F. Masur and C. H. Chang, 67
Gravity Flow Reinforced Concrete Pipe Design, Howard F. Peckworth and John G. Hendrickson, 584
Shear and Velocity Distribution in Shallow Channels, H. Lundgren and Ivar G. Jonsson, 693
Shear of Thin Plates with Flexible Edge Members, Eric R. Bryan and Wagih M. El-Dakhakhni, 289
Shearing Resistance of Soils as a Rate Process, James K. Mitchell, 369
Vibrational Transfer from Shear Buildings to Ground, Lydik S. Jacobsen, 691

SHELLS (Structural Forms)
Analysis of Spherical Shells with Stress Functions, Ziad M. Elias, 786
Experimental Buckling of Thin Sheels of Revolution, John J. Burns, Jr., 528
Experiments on Stability on Spherical Caps, Ta-Cheng Loo and Ross. M. Evan-Iwanowski, 69
Linear Strain Hardening of Cylindrical Shells, B. J. Thorn and Seng-Lip Lee, 752
Load-Deformation Behavior of Shells of Revolution, Steven C. Batterman, 704
Membrane Stresses in Laminated Anisotropic Shells, Stanley B. Dong, 228
Post-Tensioned Shallow Roof Shells for Syracuse Schools, Walter E. Riley, 421
Test of Cylindrical Shells in the Plastic Range, Giuliano Augusti and Salvatore d'Agostino, 335

SHIPS
The Drydock Lock, James R. Ayers, Arden L. Burnett, and Ralph C. Stokes, 471

SHOCK
Lumping of Mass in Calculating Vibration Response, V. H. Neubert, 219

SHORING
Old Method with New Twist Solves Bank Shoring Problem, Howard R. Gould, 105

SLABS
Direct Stress Analysis of Orthotropic Bridge Slabs, Alexander Coull, 13
Limit Design of Reinforced Concrete Slabs, Robert E. Crawford, 768

SOIL MECHANICS
Analysis of Pile Groups with Flexural Resistance, A. J. Francis, 600
Blast Loading of Small Buried Structures, Jay R. Allgood, 554
Concept of Curtain Grouting Evaluation, Leland F. Grant, 349
Consolidation Coefficient: Cohesive Soil Mixture, Robert L. Kondner and José R. Vendrell, Jr., 629
Current Lunar Soil Research, James K. Mitchell, 390
Design of Tile Drainage for Arid Regions, Hammad Y. Hammad, 749
Effect of Preconsolidation on Settlements, Leo Casagrande, 578
Effect of Site Condition on Earthquake Intensity, John H. Wiggins, Jr., 415
Electric Analogs in Time-Settlement Problems, Patrick Domenico and Glen Clark, 595
Fill Settlement Despite Vertical Sand Drains, George F. Sowers, 685
Flow Slides Prove Hazardous in Tenche Tunnel and Diversion Tunnel for Miraflores Dam, 727
Foundation Behavior of Iron Ore Storage Yards, Ralph B. Peck and Tonis Raamot, 783
Foundation Modulus Tests for Karadj Arch Dam, W. A. Waldorf, J. A. Veltrop, and J. J. Curtis, 271
Importance of Free Ends in Triaxial Testing, Peter W. Rowe and Laing Barden, 363
Inventory Index Proposed for Testing Apparatus, M. D. Morris, 331
Laminar and Turbulent Flow of Water Through Sand, M. Anandakrishnan and G. H. Varadarajulu, 474
Land Subsidence Problems, Raymond F. Dawson, 206
Load Transfer in a Step-Taper Pile, Elio D'Appolonia and John A. Hribar, 353
Machine Tunneling in Chicago Clays, Robert S. Mayo, 160
Mechanics of Inclined Filters in Earth Dams, V. J. Patel, A. V. Gopala Krishnayya, and K. L. Arora, 457
Old Method with New Twist Solves Bank Shoring Problem, Howard R. Gould, 105
Prediction of Pile Capacity by the Wave Equation, Paul W. Forehand and Joseph L. Reese, Jr., 399
Pressure Cell Observations—Garrison Dam Project, H. A. Sikso and C. V. Johnson, 653
Propagation of Shock Waves in the Ground, Theo Ginsburg, 275
Rebound in Redesign of Oahe Dam Hydraulic Structures, Lloyd B. Underwood, Stanley T. Thorfinnson, and William T. Black, 47
Retreat of Lakeshore Bluffs, Howard J. Pincus, 343
Seismic Analysis of Bridges on Long Piles, Joseph Penzien, Charles F. Scheffey, and Richard A. Parmelee, 321
Settlement Response Caused by Footing Groups, Raymond J. Krizek and Robert L. Kondner, 659

SOIL MECHANICS Continued
Shearing Resistance of Soils as a Rate Process, James K. Mitchell, 369
Shear Strength of an Anisotropically Consolidated Clay, Bengt B. Broms and M. V. Ratnam, 303
Slope Stabilized by Anchored Retaining Wall, G. A. Reti, 216
Soil-Lime Research at Iowa State University, Manuel Mateos, 433
Spacing of Drains by an Approximate Method, Gedeon Dagan, 81
Stability of Cuts in Soft Soils, T. C. Kenney, 171
Stabilization of Sand Dunes at Vandenberg Air Force Base, John Peters and Joe Sciandrone, 344
Stress-Strain Modulus of Clay in Undrained Shear, Charles C. Ladd, 589
Subgrade Stabilization Under an Existing Runway, S. Chas. Dearstyne and Gene J. Newman, 215
Underwater Inspection of Test Fill in Gatun Lake for Dam to Serve Panama Canal, Anthony P. Mann, 241
Use of Surcharges in Highway Construction, William F. Kleiman, 623
Variable-Factors Theory of Bearing Capacity, George C. Y. Hu, 291
Vibration of Gas Compressor Foundation Controlled by Chemical Grouting, Gregory P. Tschebotarioff, 253

SPECIFICATIONS
Construction Finishes and High-Velocity Flow, James W. Ball, 382
Low Pressure Air Test for Sanitary Sewers, Roy E. Ramseier and George C. Riek, 677

SPILLWAYS
Hydrology of Spillway Design: Introduction, Harvey O. Banks, 287
Hydrology of Spillway Design: Large Structures—Adequate Data, Franklin F. Snyder, 587
Hydrology of Spillway Design: Small Structures—Limited Data, Harold O. Ogrosky, 367
New Tainer Gate Hoist, H. Spencer Green, 266
Prestressed Anchorage for Large Tainter Gate, Andrew Eberhardt and Jan A. Veltrop, 757

STATISTICAL ANALYSIS
Predictive Techniques for Water Quality-Inorganics, Joe E. Ledbetter and Earnest F. Gloyna, 193

STEELS
Aeroelastic Vibration of a Steel Arch, Richard R. Bradshaw, 319
Analysis of Composite Beam Bridges by Orthotropic Plate Theory, Vilis Vitols, Rodney J. Clifton, and Tung Au, 3
Beam Column Experiments, Ralph C. Van Kuren and Theodore V. Galambos, 9
Buckling of Steel Columns Under Arbitrary End Loads, Seng-Lip Lee and G. F. Hauck, 73
Calibration of A325 Bolts, John L. Rumpf and John W. Fisher, 295
Concept of Tubular-Joint Design, Jack G. Bouwkamp, 507
Deflection of Circular Curved I Beams, Ross A. Close, 419
Deflection of Tall Guyed Tower in Dallas, J. K. Groseclose, 571
Die Cutting Cuts Cost of Open-Web Steel Beams, Leonard Kates, 313
Dynamic Plastic Analysis of Steel Frames, Barry Rawlings, 649
Flexural Fatigue Tests of Prestressed Steel I-Beams, W. Daniel Reneker and Carl E. Ekberg, Jr., 561
Gravity Flow Reinforced Concrete Pipe Design, Howard F. Peckworth and John G. Hendrickson, 584
Higher-Strength Structural Steels, J. A. Gilligan, 551
Laboratory Investigation of Unstiffened Triangular Bracket Plates, Charles G. Salmon, Donald R. Buettner, and Thomas C. O'Sheridan, 436
Reinforcement Requirements for Girder Web Openings, Edmund P. Segner, Jr., 645
Rigidity and Strength of Composite Plates, C. W. Beadle, J. W. Dally and W. F. Riley, 777
Steel Deck Bridges with Long Rib Spans, Roman Wolchuk, 115

STIFFNESS
Analysis of Pile Groups with Flexural Resistance, A. J. Francis, 600

STORMS
Guam Typhoon Tears Out Hospital Windows, Harold V. Ehlers, 337

STRAINS
Analysis of Short Span Folded Plates, Kaveti Seetharamulu and Mangesh G. Kulkarni, 699
Bending and Buckling of Thin-Walled Open-Section Rings, James A. Cheney, 85
Linear Strain Hardening of Cylindrical Shells, B. J. Thorn and Seng-Lip Lee, 752

STREAMS
Analysis of Sewage Treatment Systems by Simulation, M. Mead Montgomery and Walter R. Lynn, 361
Annual Variation of Stream Water Temperature, J. C. Ward, 258
Mathematical Model for Dissolved Oxygen, Robert V. Thomann, 153
Regime Criteria for Alluvial Streams, R. J. Garde and K. G. Ranga Raju, 178

STRESSES
Analysis of Spherical Shells with Stress Functions, Ziad M. Elias, 786
Bending and Buckling of Thin-Walled Open-Section Rings, James A. Cheney, 85
Circular Plates Loaded into the Plastic Region, Leslie M. Lackman, 787
Deflection of Hinged Rings Under Uniform Pressure, James A. Cheney, 451
Flexural Fatigue Tests of Prestressed Steel I-Beams, W. Daniel Reneker and Carl E. Ekberg, Jr., 561
General Computer Analysis of Beams, John E. Goldberg, John L. Bogdanoff, and William D. Glauz, 80
Membrane Stresses in Laminated Anisotropic Shells, Stanley B. Dong, 228
Orthotropic Beams Under Polynominal Loads, Isadore K. Silverman, 634
Pressure Testing of Thick Reinforced Concrete Cell, Stanley H. Fistedis, 324
Relief of Residual Stresses by Heating Patterns, T. H. Lin and Leslie M. Lackman, 675

STRESSES Continued
Stresses at Tunnel Intersections, William F. Riley, 615

STRUCTURAL ENGINEERING
Aeroelastic Vibration of a Steel Arch, Richard R. Bradshaw, 319
Analysis of Composite Beam Bridges by Orthotropic Plate Theory, Vilis Vitols, Rodney J. Clifton, and Tung Au, 3
Analysis of Folded Plate Structures, George G. Goble, 387
Analysis of Laterally Loaded Gridworks, Thein Wah, 481
Analysis of Orthotropic Plate Bridges, Rodney J. Clifton, Jerry C. L. Chang, and Tung Au, 139
Analysis of Short Span Folded Plates, Kaveti Seetharamulu and Mangesh G. Kulkarni, 699
Beam Columns Experiments, Ralph C. Van Kuren and Theodore V. Galambos, 9
Behavior of Hybrid Beams Subjected to Static Loads, Ronald W. Frost and Charles G. Schilling, 604
Blast Loading of Small Buried Structures, Ray R. Allgood, 554
Buckling Loads for Stepped Columns, John W. Harvey, 618
Buckling of a Prestressed Circular Ring, John E. Goldberg and John L. Bogdanoff, 767
Buckling of Longitudinally Stiffened Cylinders, Jeng C. Shang, Walter J. Marulic, and Rolland G. Sturm, 667
Buckling of Steel Columns Under Arbitrary End Loads, Seng-Lip Lee and G. F. Hauck, 73
Cable Movements Under Two-Dimensional Loads, W. Terence O'Brien and Arthur J. Francis, 737
Calibration of A325 Bolts, John L. Rumpf and John W. Fisher, 295
Collapse of Arches Under Repeated Loading, Vicenzo Franciosi, Giuliano Augusti, and Renato Sparcio, 391
Computer Systems for Matrix Operations, Herbert Rothman and Peter Reilly, 763
Concept of Tubular-Joint Design, Jack G. Bouwkamp, 507
Constant Shear Moment Distribution, Michael Jordan, 34
Deflection of Circular Curved I Beams, Ross A. Close, 419
Depth Selection of Built-Up I-Sections, J. S. Alagia, 687
Design of Haunched Beams by Fixed Points, Stanton E. Huey, 613
Die Cutting Cuts Cost of Open-Web Steel Beams, Leonard Kates, 313
Direct Stiffness Solution for Folded Plates, Arnim DeFries-Skene and A. C. Scordelis, 717
Direct Stress Analysis of Orthotropic Bridge Slabs, Alexander Coull, 13
Dynamic Analysis of Elastic-Plastic Frames, Arthur C. Heidebrecht, Seng-Lip Lee, and John F. Fleming, 33
Dynamic Plastic Analysis of Steel Frames, Barry Rawlings, 649
Dynamic Response Functions, Bruce S. Berger, 515
Effect of Site Condition on Earthquake Intensity, John H. Wiggins, Jr., 415
Eigen-Matrix Method for Beams and Plates, Bennosuke Tanimoto, 103
Energy Absorption of Structures Under Cyclic Loading, Kenneth Medearis and D. H. Young, 249
Error Statistics for Reinforced Concrete Beams, Theodore Zsutty, 158
Fatigue of Joints in Aluminum Alloy 6061-T6, Glenn E. Nordmark and John W. Clark, 744
Flexural Calculation of Nonuniform Members, Shou-ling Wang, 164
Flexural Fatigue Tests of Prestressed Steel I-Beams, W. Daniel Reneker and Carl E. Ekberg, Jr., 561
Flow Graph of Moment Distribution, Chuan C. Feng and Richard D. Benton, 218
Frequence Analysis of Beams by Flexibility Method, James N. Gillespie and Boen-Dar Liaw, 233
General Computer Program for Limit Analysis, Chu-Kia Wang, 161
Generation of Artificial Earthquakes, G. W. Housner and P. C. Jennings, 530
Golden Gateway (Symposium): M. Justin Herman, William W. Moore, Stanley E. Teixeira, Don Gillis, 17
Guide to Development and Use of Electronic Computer Programs: Engineering Analysis, Elwyn H. King, 775
Higher-strength structural steels, J. A. Gilligan, 551
Influence-Line Spectrum by Graphical Construction, Charles G. Salmon, and Donald R. Buettner, 428
Iterative Limit Load Analysis for Tall Frames, Niels C. Lind, 661
Laboratory Investigation of Unstiffened Triangular Bracket Plates, Charles G. Salmon, Donald R. Buettner, and Thomas C. O'Sheridan, 436
Lateral Stability of Glued Laminated Beams, R. F. Hooley and B. Madsen, 781
Limit Analysis of Grid Frameworks, F. S. Shaw, 330
Limit Design of Reinforced Concrete Slabs, Robert E. Crawford, 768
Long Bolted Joints, Robert A. Bendigo, Roger M. Hansen, and John L. Rumpf, 274
Matrix Analysis of Semi-Rigidly Connected Frames, G. R. Monforten and T. S. Wu, 149
Model Balsa-Wood Bridges in Education, Boyd C. Ringo, 83
Moment Coefficients for Fixed-End Beams to be Used in the Three-Moment Equation, Thomas D. Y. Fok and Thomas F. Mosure, 449
Moment Coefficients for Frame Analysis, Frederick P. Wiesinger, Seng-Lip Lee and John F. Fleming, 39
Moment Equations for Computer Analysis of Frames, Semih S. Tezcan, 673
New Light on Blasting Vibration Effects, Harold H. White, 252
Nonlinear Behavior of Structural Plane Frames, S. A. Saafan, 197
Numerical Method for Structural Shock Response, G. J. O'Hara and P. F. Cuniff, 169
Numerical Methods in Bending and Buckling of Plates, A. N. Sherbourne, 51
Optical Tooling for Precise Structural Measurements, Gerald C. Ward and John F. Ely, 225
Parabolic Arches of Variable Thickness, Alfred L. Parme and Eugene P. Holland, 779

STRUCTURAL ENGINEERING Continued
Periodic Response of a General Yielding Structure, Paul C. Jennings, 121
Philosophy of Engineering Design of Structures, Malcolm S. Gregory, 59
Plastic Analysis of Circular Balcony Girders, Kuang-Han Chu and Arthur Thelen, 62
Precast Segmental Construction for Long-span Bridges, Ben C. Gerwick, 44
Preliminary Analysis of Continuous Curved Girder Frames, Delbert C. Carman and Jan J. Tuma, 642
Preliminary Design of Concrete Dams by Computers, Ralph Weaver, 99
Prestressed Anchorage for Large Tainter Gate, Andrew Eberhardt and Jan A. Veltrop, 757
Pressure Testing of Thick Reinforced Concrete Cell, Stanley H. Fistedis, 324
Propagation of Shock Waves in the Ground, Theo Ginsburg, 275
Regression Analysis of Reinforced Concrete Columns, Haresh C. Shah, 345
Reinforcement Requirements for Girder Web Openings, Edmund P. Segner, Jr., 645
Resonance Testing of Full-Scale Structures, Donald E. Hudson, 655
Response of Structures to Triangular Pulse Loading, Tseng Huang, 327
Section Modulus of Beams with Unsymmetrical Cover Plates, Tom L. Underwood, 286
Seismic Analysis of Bridges on Long Piles, Joseph Penzien, Charles F. Scheffey, and Richard A. Parmelee, 321
Shear of Thin Plates with Flexible Edge Members, Eric R. Bryan and Wagih M. El-Dakhakhni, 289
Stability of Elasto-Plastic Wide-Flange Columns, George F. Hauck and Seng-Lip Lee, 94
Steel Deck Bridges with Long Rib Spans, Roman Wolchuk, 115
Strength of Elastically Stabilized Beams, Robert W. Haussler, 637
Stress Analysis of Prestressed Suspended Roofs, Avinadav Siev and J. Eidelman, 518
Stronger Structural Bolt—Will Cut Costs, Speed Construction, Fred E. Graves and William A. Milek, 557
Structural Analysis of Multistory Buildings, Ray W. Clough, Ian P. King, and Edward L. Wilson, 729
Structure Designs Governed by Limited Deformations, Jacob Solomon, 477
Temperature Stresses in Tall Reinforced Concrete Buildings, Paul Weidlinger, 377
Vacuum-Cast Refractory Castables, David J. Damiano, 539
Welded Bridge Girders, Omer W. Blodgett, 27
Welded Constructional Alloy Plate Girders, P. B. Cooper, H. S. Lew, and B. T. Yen, 123
What Is Available in Structural Aluminum, J. Robert Stemler and John W. Clark, 213
Yellowtail Dam on Big Horn River, Instrumented for Structural Behavior Studies, Keith Jones, 567
Zero Sidesway of Rigid Frames, A. J. Celis and P. Glockner, 19

STRUCTURES
Numerical Method for Structural Shock Response, G. J. O'Hara and P. F. Cuniff, 169

SUBSIDENCE
Land Subsidence Problems, Raymond F. Dawson, 206

SURVEYING
Aerial Traverse and Maximum Bridging Distance, Sandor A. Veres, 211
Analogue Aerial Triangulation, Herbert S. Williams, 245
Control Traverses and Their Adjustment, Everett D. Morse, 181
Daylight Star Observations in Antarctica, Douglas R. Lee, 221
New Techniques for Very Accurate Measurement, Eugene H. Koenig, 358
Optical Tooling for Precise Structural Measurements, Gerald C. Ward and John F. Ely, 225
Photogrammetry and Highway Law, Morris M. Abrams, 191
Planning and Design of Aerotriangulation Projects, Houssam M. Karara, 424
Simultaneous Relative Orientation of Multiple Cameras, Houssam M. Karara and Atef A. Elassal, 70
Surveying and Mapping and Environmental Engineering, William T. Pryor, 631
Surveyors' Footsteps, W. C. Wattles, 208
Surveys and Maps for Industrial Growth, Earle J. Fennell, 671
Vertical Gradient of Gravity, Ivan I. Mueller, 235

SUSPENSION BRIDGES
Verrazano-Narrows Bridge—Design Concepts and Construction Procedure, O. H. Ammann, 695

TERMINALS
Houston's Jetero Airport: Development of Terminal and Related Areas, Robert O. Grimes, 263
Operations of the Supersonic Transport in the Terminal Area, Francis T. Fox, 581

TESTING
Annual Variation of Stream Water Temperature, J. C. Ward, 258
Beam Column Experiments, Ralph C. Van Kuren and Theodore V. Galambos, 9
Buckling of Longitudinally Stiffened Cylinders, Jeng C. Shang, Walter J. Marulic, and Rolland G. Sturm, 667
Calibration of A325 Bolts, John L. Rumpf and John W. Fisher, 295
Channel Changes in the St. Clair River Since 1933, Ira M. Korkigian, 5
Deflection of Circular Curved I Beams, Ross A. Close, 419
Experimental Buckling of Thin Shells of Revolution, John J. Burns, Jr., 528
Experiments on Stability on Spherical Caps, Ta-Cheng Loo and Ross M. Evan-Iwanowski, 69
Fatigue of Joints in Aluminum Alloy 6061-T6, Glenn E. Nordmark and John W. Clark, 744
Flexural Fatigue Tests of Prestressed Steel I-Beams, W. Daniel Reneker and Carl E. Ekberg, Jr., 561
Flow Measurement with a Suspension Wire, Bruce B. Sharp, 467
Foundation Modulus Tests for Karadj Arch Dam, W. A. Waldorf, J. A. Veltrop, and J. J. Curtis, 271
Hydraulic Jump in All Shapes of Horizontal Channels, R. Silvester, 75

TESTING Continued
Importance of Free Ends in Triaxial Testing, Peter W. Rowe and Laing Barden, 363
Kinetics of Aerobic Removal of Organic Wastes, K. Keshavan, V. C. Behn, and W. F. Ames, 770
Laboratory Investigation of Unstiffened Triangular Bracket Plates, Charles G. Salmon, Donald R. Buettner, and Thomas C. O'Sheridan, 436
Load Transfer in a Step-Taper Pile, Elio D'Appolonia and John A. Hribar, 353
Natural Roughness Effects in Rigid Open Channels, A. G. Mirajgaoker and K. L. N. Charlu, 544
Pneumatic Reduction of Salt Intrusion Through Locks, G. Abraham and P. Vander Burgh, 166
Prediction of Pile Capacity by the Wave Equation, Paul W. Forehand and Joseph L. Reese, Jr., 399
Pressure Cell Observations—Garrison Dam Project, H. A. Sikso and C. V. Johnson, 653
Pressure Testing of Thick Reinforced Concrete Cell, Stanley H. Fistedis, 324
Reinforcement Requirements for Girder Web Openings, Edmund P. Segner, Jr., 645
Resonance Testing of Full-Scale Structures, Donald E. Hudson, 655
Shear of Thin Plates with Flexible Edge Members, Eric R. Bryan and Wagih M. El-Dakhakhni, 289
Shear Strength of an Anisotropically Consolidated Clay, Bengt B. Broms and M. V. Ratnam, 303
Stress-Strain Modulus of Clay in Undrained Shear, Charles C. Ladd, 589
Study of Sediment Ripple Formation, A. J. Raudkivi, 110
Subgrade Stabilization Under an Existing Runway, S. Chas. Dearstyne and Gene J. Newman, 215
Test of Cylindrical Shells in the Plastic Range, Giuliano Augusti and Salvatore d'Agostino, 335
Welded Constructional Alloy Plate Girders, P. B. Cooper, H. S. Lew, and B. T. Yen, 123

TIDES
Waste Disposal in Tidal Waters, Alex N. Diachishin, 563

TILES
An Experiment on Flow Through Smooth Tile Joints, A. F. Pillsbury, E. H. Taylor, R. W. Pelishek, and J. F. Osborn, 455

TOPOGRAPHY
Daylight Star Observations in Antarctica, Douglas R. Lee, 221

TORSION
Bending and Buckling of Thin-Walled Open-Section Rings, James A. Cheney, 85

TOWERS
Deflection of tall guyed tower in Dallas, J. K. Groseclose, 571
The Bow Mooring for Berthing Tankers, Leonard E. Van Houten and G. A. McCammon, 125

TRACERS
Time of Travel of Soluble Contaminants in Streams, Thomas J. Buchanan, 669

TRAFFIC
Analytical Methods in Transportation: Digital Simulation of Traffic, Aaron Glickstein, 498
Analytic Methods in Transportation: Left Turn Penalties in Traffic Assignment Models, Joseph A. Wattleworth and Paul W. Shuldiner, 346
Analytic Methods in Transportation: Mathematical Car-Following Theory of Traffic Flow, Denos C. Gazis, Robert Herman, and Richard W. Rothery, 78
Electronic Guidance for Highway Safety, John J. O'Mara, 519

TRANSIT SYSTEMS
Evaluating Urban Transportation Systems, George Haikalis and E. Wilson Campbell, 479

TRANSMISSION LINES
Increasing the Efficiency of Helicopters on Transmission-Line Construction, E. S. Zobel and R. A. Kravitz, 489

TRANSPORTATION
Designing the San Francisco Bay Area Rapid Transit System, William A. Bugge, Leslie Irvin, 559
Evaluating Urban Transportation Systems, George Haikalis and E. Wilson Campbell, 479
New Ways to See Land Use and Transportation, J. Douglas Carroll, Jr., 365
Report on Engineering Foundation's Research Conference on Urban Transportation, 201

TUNNELING (Excavation)
Machine Tunneling For Storm Sewer Under Houston, W. D. Murphy, 393
Machine Tunneling in Chicago Clays, Robert S. Mayo, 160
Underground NORAD Command Center at Colorado Springs, Theodore O. Blaschke, 237

TUNNELS (Transportation)
A Tunnel Favored for English Channel Crossing, John O. Bickel, 304
Design and Performance of Mammoth Pool Power Tunnel, Bruce R. Laverty and Klaus R. Ludwig, 416
Stresses at Tunnel Intersections, William F. Riley, 615
Subway Tunnel Construction in New York City, Gail B. Knight, 503

TURBULENCE
Laminar and Turbulent Flow of Water Through Sand, M. Anandakrishnan and G. H. Varadarajulu, 474

UNION OF SOVIET SOCIALIST REPUBLICS
Regulation of the Caspian Sea, Otakar W. Kabelac, 609

U. S. AIR FORCE
Underground NORAD Command Center at Colorado Springs, Theodore O. Blaschke, 237

URBAN PLANNING
California—San Francisco's Golden Gateway Development (a symposium): M. Justin Herman, William W. Moore, Stanley E. Teixeira, Don Gillis, 17
Designing the San Francisco Bay Area Rapid Transit System, William A. Bugge, Leslie Irvin, 559

URBAN PLANNING Continued
New Ways to See Land Use and Transportation, J. Douglas Carroll, Jr., 365
The Civil Engineer in Urban Planning, W. H. Wisely, 723
User Criteria for Rapid Transit Planning, Paul J. Claffey, 360

UTILITIES
Houston's Jetero Airport: Development of Terminal and Related Areas, Robert O. Grimes, 263
Interest on Capital Invested in Construction, J. F. Muir and Eugen Ruus, 635

VALVES
Navigation Locks: Navigation Lock Gates and Valves, George C. Richardson, 394

VELOCITY
Construction Finishes and High-Velocity Flow, James W. Ball, 382
Shear and Velocity Distribution in Shallow Channels, H. Lundgren and Ivar G. Jonsson, 693
Velocity of a Water-Hammer Wave in an Elastic Pipe, A. R. Halliwell, 1
Von Mises Transformation for Boundary Layer Theory, Chieh-Shyang Song, 239

VIBRATION
Aeroelastic Vibration of a Steel Arch, Richard R. Bradshaw, 319
Dynamic Stability of Axially Vibrating Columns, I. K. McIvor, 714
Form-Induced Hydraulic Forces on Three-Leaf Intake Gates, Rex A. Elder and Jack M. Garrison, 771
Lumping of Mass in Calculating Vibration Response, V. H. Neubert, 219
On a Kind of Hysteretic Damping, Emilio Rosenblueth and Ismael Herrera, 521
Resonance Testing of Full-Scale Structures, Donald E. Hudson, 655
Response of Structures to Triangular Pulse Loading, Tseng Huang, 327
Vibrational Transfer from Shear Buildings to Ground, Lydik S. Jacobsen, 691
Vibration of Gas Compressor Foundation Controlled by Chemical Grouting, Gregory P. Tschebotarioff, 253

WAREHOUSES
Alternate Design Proves Economy of Precast Prestressed Design for Seattle Pier Shed, Wheeler H. Rucker, Jr., 231
Paving Roof Decks and Industrial Floors, Lansing Tuttle, 301

WASTE DISPOSAL
Incineration (Symposium): Lenard S. Wegman, Junius W. Stephenson, Robert L. Stenburg, Harold G. Meissner, 491
Lightweight Aggregate Prepared from Fly Ash by Consolidated Edison in N.Y.C., A. S. Pearson, 411

WASTES
Heat Generation by Radioactive Wastes, Earnest F. Gloyna, H. J. Longley, and C. W. Christenson, 636

WATER DISTRIBUTION
Desirable Features of Water Rights Laws, Dan S. Jones, Jr., 512

WATER FLOW
Flow Measurement with a Suspension Wire, Bruce B. Sharp, 467
Laminar and Turbulent Flow of Water Through Sand, M. Anandakrishnan and G. H. Varadarajulu, 474
Practical Computations of Bed-Material Discharge, Bruce R. Colby, 383
Study of Sediment Ripple Formation, A. J. Raudkivi, 110
Temporary Flow Measurement in Sewers and Drains, M. H. Diskin, 299
Unsaturated Flow in Ground Water Hydraulics, Herman Bouwer, 593
Velocity of a Water-Hammer Wave in an Elastic Pipe, A. R. Halliwell, 1
Water Right Engineering Under Appropriation System, Kenneth R. Wright, 280

WATER HAMMER
Pressure Generated by Cavitation in a Pipe, Wen-Hsiung Li and James P. Walsh, 789
Velocity of a Water-Hammer Wave in an Elastic Pipe, A. R. Halliwell, 1

WATER QUALITY
A Lake's Response to Its Environment, Robert O. Sylvester and George C. Anderson, 11
Lost River System-A Water Quality Management Study, Gerald T. Orlob and Philip C. Woods, 87
Predictive Techniques for Water Quality-Inorganics, Joe E. Ledbetter and Earnest F. Gloyna, 193
Water Quality Changes in Elephant Butte Reservoir, John H. Bliss, 57

WATER RESOURCES
Ground-Water Management for the Nation's Future—Water Resources Management Through Ground-Water Basin Operation, Lloyd C. Fowler, 725
Flood Plain Management Improves Man's Environment, James E. Goddard, 24

WATER SUPPLY
Indus-Valley—West Pakistan's Life Line, Alexander Karpov, 509
Optimum Design of Multi-Purpose Reservoirs, Warren A. Hall, 762
Separation of Evapotranspiration and Deep Percolation, Lyman S. Willardson and Wendell L. Pope, 56
Study of Municipal and Irrigation Water Shortages, C. B. Thompson, 446

WATER TREATMENT
Whittier Narrows Water Reclamation Plant, John D. Parkhurst and Walter E. Garrison, 499

WATERWAYS
Channel Changes in the St. Clair River Since 1933, Ira M. Korkigian, 5
Control Structures for Sand-Bed Channels, Frederick C. Stepanich, Daryl B. Simons, and Everett V. Richardson, 485

WATERWAYS Continued
Flood Plain Management Improves Man's Environment, James E. Goddard, 24
How a Waterway Improvement Changed Environment, Robert B. Nichols, 641
Hydraulic Aspects of Arkansas River Stabilization, Margaret S. Petersen, 625
Long Wave Modification by Linear Transitions, Robert G. Dean, 689
Navigation Locks: End Filling and Emptying Systems for Locks, Fred R. Brown, 651
Navigation Locks: Filling and Emptying Systems for Locks, Martin E. Nelson and Harvey J. Johnson, 398
Navigation Locks: Navigation Lock Gates and Valves, George C. Richardson, 394
Navigation Locks: TVA's Multiport Lock Filling and Emptying System, Rex A. Elder, James T. Price, and Ward W. Engle, 379
Pneumatic Reduction of Salt Intrusion Through Locks, G. Abraham and P. Vander Burgh, 166
Regulation of the Caspian Sea, Otakar W. Kabelac, 609
The Drydock Lock, James R. Ayers, Arden L. Burnett, and Ralph C. Stokes, 471

WAVES
Long Wave Modification by Linear Transitions, Robert G. Dean, 689
Prediction of Pile Capacity by the Wave Equation, Paul W. Forehand and Joseph L. Reese, Jr., 399
Small-Craft Harbor Problems, Charles E. Lee, 647
Travel Time of Waves in Backwaters, Andrew L. Simon, 84
Velocity of a Water-Hammer Wave in an Elastic Pipe, A. R. Halliwell, 1

WELDING
Concept of Tubular-Joint Design, Jack G. Bouwkamp, 507
Die Cutting Cuts Cost of Open-Web Steel Beams, Leonard Kates, 313
Relief of Residual Stresses by Heating Patterns, T. H. Lin and Leslie M. Lackman, 675
Section Modulus of Beams with Unsymmetrical Cover Plates, Tom L. Underwood, 286
The New Welding Code for Buildings, Arsham Amirikian, 396
Welded Bridge Girders, Omer W. Blodgett, 27

WELLS
Indus-Valley—West Pakistan's Life Line, Alexander Karpov, 509
Supplement to Peterson's Design of Replenishment Wells, Mahdi S. Hantush, 101

ZONING
Flood Plain Management Improves Man's Environment, James E. Goddard, 24

AUTHOR INDEX

{including Memoirs of deceased members}

ABERNATHEY, JAMES M.
Some Ethical Implications of Professional Planning, 803

ABRAHAM, G.
Pneumatic Reduction of Salt Intrusion Through Locks, with P. van der Burgh, 166

ABRAMS, MORRIS M.
Photogrammetry and Highway Law, 191

ACKERMAN, ADOLPH J.
Using Engineering to Enslave You, 340

ACKERMANN, NORBERT L.
Development of a Solid-Liquid Flow Meter, with Chaleo Niyomthai, 381

AHLBORN, GALE
See Robert Horonjeff

ALAGIA, J. S.
Depth Selection of Built-Up I-Sections, 687

ALLGOOD, JAY R.
Blast Loading of Small Buried Structures, 554

ALTER, AMOS J.
Sanitary Engineering in Alaska, 145

ALWAR, R. S.
See K. T. Sundara Raja Iyengar

AMES, W. F.
See K. Keshavan

AMIRIKIAN, ARSHAM
The New Welding Code for Buildings, 396

AMMANN, O. H.
Verrazano-Narrows Bridge H Design Concepts and Construction Procedure, 695

ANANDAKRISHNAN, M.
Laminar and Turbulent Flow of Water Through Sand, with G. H. Varadarajulu, 474

ANANTHARAMU, S.
See K. T. Sundara Raja Iyengar

ANDERSON, GEORGE C.
See Robert O. Sylvester

ARAS, RESTAN M.
PERT and CPM Techniques in Project Management, with Julius Surkis, 486

ARMSTRONG, THOMAS HUDSON
Memoir of, 811

ARNBERG, JOHN E.
Seattle Viaduct Redesigned Using CPM, with Roy W. Morse and Douglas L. Jonas, 523

ARORA, K. L.
See V. J. Patel

ATTERBURY, THOMAS J.
See George M. McClure

AU, TUNG
See Rodney J. Clifton
See Vilis Vitols

AUGUSTI, GIULIANO
Tests of Cylindrical Shells in the Plastic Range, with Salvatore d'Agostino, 335
See Vicenzo Franciosi

AYERS, JAMES R.
The Drydock Lock, with Arden L. Burnett, and Ralph C. Stokes, 471

BACON, SUMNER DAVIS
Memoir of, 811

BALL, JAMES W.
Construction Finishes and High-Velocity Flow, 382

BANKS, HARVEY O.
Hydrology of Spillway Design: Introduction, 287

BARDEN, LAING
See Peter W. Rowe

BARNES, STANLEY M.
Analysis of Precipitation at Huntington Lake, 469

BARTLETT, FRANK ADAMS
Memoir of, 812

BATTERMAN, STEVEN C.
Load-Deformation Behavior of Shells of Revolution, 704

BAUER, EDWARD EZRA
Memoir of, 813

BEADLE, C. W.
Rigidity and Strength of Composite Plates, with J. W. Dally and W. F. Riley, 777

BEHN, VAUGHN C.
See K. Keshavan

BENDER, OSTAP
See Raymond E. Davis

BENDIGO, ROBERT A.
Long Bolted Joints, with Roger M. Hansen and John L. Rumpf, 274

BENTON, RICHARD D.
See Chuan C. Feng

BENZON, FRANK BROWNING
Memoir of, 814

BERGER, BRUCE S.
Dynamic Response Functions, 515

BERMAN, SIDNEY
Memoir of, 815

BICKEL, JOHN O.
A Tunnel Favored for English Channel Crossing, 304

BITOUN, MARCEL
See Victor A. Koelzer

BLACK, WILLIAM T.
See Lloyd B. Underwood

BLACKMAN, GEORGE E.
See Richard F. Foster

BLASCHKE, THEODORE O.
Underground NORAD Command Center at Colorado Springs, 237

BLISS, JOHN H.
Water Quality Changes in Elephant Butte Reservoir, 57

BLODGETT, OMER W.
Welded Bridge Girders, 27

BOGDANOFF, JOHN L.
See John E. Goldberg

BOGGS, E. W.
Vibratory Driver Successful for Sheetpile Cells in Erie Harbor, 243

BORESI, ARTHUR P.
See George E. Sliter

BOUWER, HERMAN
Unsaturated Flow in Ground Water Hydraulics, 593

BOUWKAMP, JACK G.
Concept of Tubular-Joint Design, 507

BRADSHAW, RICHARD R.
Aeroelastic Vibration of a Steel Arch, 319

BRITVEC, S. J.
Elastic Buckling of Rigidly-Jointed Braced Frames, with A. H. Chilver, 173

BROMS, BENGT B.
Shear Strength of an Anisotropically Consolidated Clay, with M. V. Ratnam, 303

BROWN, BELFORD
Economics and Finance in Airport Planning, 488

BROWN, FRED R.
Navigation Locks: End Filling and Emptying Systems for Locks, 651

BROWN, LEVANT R.
Memoir of, 816

BRUSH, LUCIEN M.
Accelerated Motion of a Sphere in a Viscous Fluid, with Hau-Wong Ho, and Ben-Chie Yen, 541

BRYAN, ERIC R.
Shear of Thin Plates with Flexible Edge Members, with Wagih M. El-Dakhakhni, 289

BUCHANAN, THOMAS J.
Time of Travel of Soluble Contaminants in Streams, 669

BUETTNER, DONALD R.
Influence-Line Spectrum by Graphical Construction, with Charles G. Salmon, 428
See Charles G. Salmon

BUGGE, WILLIAM A.
Designing the San Francisco Bay Area Rapid Transit System, with Leslie Irvin, 559

BURNETT, ARDEN L.
See James R. Ayers

BURNS, HOWARD C.
See Martin A. Warskow

BURNS, JOHN J., JR.
Experimental Buckling of Thin Shells of Revolution, 528

CAMPBELL, E. WILSON
See George Haikalis

CAMPBELL, HENRY BAYNE
Memoir of, 817

CARMAN, DELBERT C.
Preliminary Analysis of Continuous Curved Girder Frames, with Jan J. Tuma, 642

CARROLL, J. DOUGLAS, JR.
New Ways to See Land Use and Transportation, 365

CAROTHERS, HENRY P.
Rigid and Stiff Airport Paving, 791

CARSEN, DAVID
See Charles P. C. Tung

CARTER, MELVIN W.
See Conrad P. Straub

CARTER, RALF C.
See Harvey F. Ludwig

CASAGRANDE, LEO
Effect of Preconsolidation on Settlements, 578

CATES, WALTER H.
Design of Flexible Steel Pipe Under External Loads, 599

CELIS, A. J.
Zero Sidesway Axis of Rigid Frames, with P. Glockner, 19

CHADWICK, WALLACE L.
A Design for the Future, Annual Address at the Conference, Minneapolis, Minnesota, 807

CHANG, C. H.
See Ernest F. Masur

CHANG, JERRY C. L.
See Rodney J. Clifton

CHARLU, K. L. N.
See A. G. Mirajgaoker

CHASE, E. SHERMAN
Education for Sanitary Engineers, 801

CHEN, TSU-FANG
Disintegration of a Turbulent Water Jet, with John R. Davis, 97

CHENEY, JAMES A.
Bending and Buckling of Thin-Walled Open-Section Rings, 85
Deflection of Hinged Rings Under Uniform Pressure, 451

CHILVER, A. H.
See S. J. Britvec

CHOW, JOSEPH C. F.
Application of Acoustics in Air Pollution Problems, 624

CHRISTENSON, C. W.
See Earnest F. Gloyna

CHU, KUANG-HAN
Elastic and Inelastic Buckling of Portal Frames, with Algis Pabarcius, 773
Plastic Analysis of Circular Balcony Girders, with Arthur Thelen, 62

CHUN, ROBERT Y. D.
Ground-Water Management for the Nation's Future—Optimum Conjunctive Operation of Ground-Water Basins, with Lewis R. Mitchell and Kiyoshi W. Mido, 355

CLAFFEY, PAUL J.
User Criteria for Rapid Transit Planning, 360

CLARK, GLEN
See Patrick Domenico

CLARK, JOHN W.
See Glenn E. Nordmark
See J. Robert Stemler

CLIFTON, RODNEY J.
Analysis of Orthotropic Plate Bridges, with Jerry C. L. Chang and Tung Au, 139
See Vilis Vitols

CLOSE, ROSS A.
Deflection of Circular Curved I Beams, 419

CLOUGH, RAY W.
Structural Analysis of Multistory Buildings, with Ian P. King and Edward L. Wilson, 729

COLBY, BRUCE R.
Practical Computations of Bed-Material Discharge, 383

COOPER, PETER B.
Welded Constructional Alloy Plate Girders, with H. S. Lew and B. T. Yen, 123

COULL, ALEXANDER
Direct Stress Analysis of Orthotropic Bridge Slabs, 13

COZZENS, HOWARD FRANCIS
Memoir of, 817

CRAWFORD, ROBERT E.
Limit Design of Reinforced Concrete Slabs, 768

CUNIFF, PATRICK F.
See G. J. O'Hara

CURTIS, J. J.
See W. A. Waldorf

DAGAN, GEDEON
Spacing of Drains by an Approximate Method, 81

d'AGOSTINO, SALVATORE
See Giuliano Augusti

DALLY, J. W.
See C. W. Beadle

DAMIANO, DAVID J.
Vacuum-Cast Refractory Castables, 539

D'APPOLONIA, ELIO
Load Transfer in a Step-Taper Pile, with J. A. Hribar, 353

DAVIS, JOHN R.
See Ali M. Shahroody
See Tsu-Fang Chen

DAVIS, RAYMOND E.
California Builds Experimental Orthotropic Plate Bridge, with Ostap Bender, 547

DAWSON, RAYMOND F.
Land Subsidence Problems, 206

DEAN, DONALD L.
Lamella Beams and Grids, 255

DEAN, ROBERT G.
Long Wave Modification by Linear Transitions, 689

DEARSTYNE, S. CHAS.
Subgrade Stabilization Under an Existing Runway, with Gene J. Newman, 215

DeFRIES-SKENE, ARNIM
Direct Stiffness Solution for Folded Plates, with A. C. Scordelis, 717

DEGNAN, LAURENCE VALENTINE
Memoir of, 818

DEMPSTER, G. R., JR.
See H. H. Stevens, Jr.

DIACHISHIN, ALEX N.
Waste Disposal in Tidal Waters, 563

DISKIN, M. H.
Temporary Flow Measurement in Sewers and Drains, 299

DOMENICO, PATRICK
Electric Analogs in Time-Settlement Problems, with Glen Clark, 595

DONG, STANLEY B.
Membrane Stresses on Laminated Anisotropic Shells, 228

EAGER, WILLIAM R.
See Wolfgang S. Homburger

EBERHARDT, ANDREW
Prestressed Anchorage for Large Tainter Gate, with Jan A. Veltrop, 757

EHLERS, HAROLD V.
Guam Typhoon Tears Out Hospital Windows, 337

EHRMAN, KENT S.
Plastic Surgery on Irrigation Areas, 29

EIDELMAN, J.
See Avindav Siev

EKBERG, CARL E., JR.
See W. Daniel Reneker

ELASSAL, ATEF A.
See Houssam M. Karara, 70

EL-DAKHAKHNI, WAGIH M.
See Eric R. Bryan

ELDER, REX A.
Form-Induced Hydraulic Forces on Three-Leaf Intake Gates, with Jack M. Garrison, 771
Navigation Locks: TVA's Multiport Lock Filling and Emptying System, with James T. Price and Ward W. Engle, 379

ELDRIDGE, EDWARD FRANKLIN
Memoir of, 819

ELIAS, ZIAD M.
Analysis of Spherical Shells with Stress Functions, 786

ELLIS, RICHARD
Memoir of, 820

ELY, JOHN F.
See Gerald C. Ward

ENGLE, WARD W.
See Rex A Elder

EVAN-IWANOWSKI, ROSS M.
See Ta-Cheng Loo

FELLOWS, HENRY D.
Application of Supersonic Aircraft to Airline Operations, 721

FENG, CHUAN C.
Flow Graph of Moment Distribution, with Richard D. Benton, 218

FENNELL, EARLE J.
Surveys and Maps for Industrial Growth, 671

FISHER, GORDON P.
Digital Computers and Environmental Control, with Walter R. Lynn, 334

FISHER, JOHN W.
See John L. Rumpf

FISTEDIS, STANLEY H.
Pressure Testing of Thick Reinforced Concrete Cell, 324

FITZ SIMONS, NEAL
The Role of the Civil Engineer in Civil Defense, 118

FLEMING, JOHN F.
See Arthur C. Heidebrecht
See Frederick P. Wiesinger

FOK, THOMAS D. Y.
Moment Coefficients for Fixed-End Beams to be Used in the Three-Moment Equation, with Thomas F. Mosure, 449

FOREHAND, PAUL W.
Prediction of Pile Capacity by the Wave Equation, with Joseph L. Reese, Jr., 399

FOSTER, RICHARD F.
Action Guide for Radioactive Effluents from PRTR, with George E. Blackman, Norman C. Wittenbrock and John M. Skarpelos, 41

FOWLER, LLOYD C.
Ground-Water Management for the Nation's Future—Water Resources Management Through Ground-Water Basin Operation, 725

FOX, FRANCIS T.
Operations of the Supersonic Transport in the Terminal Area, 581

FRANCIOSI, VICENZO
Collapse of Arches Under Repeated Loading, with Giuliano Augusti and Renato Sparacio, 391

FRANCIS, ARTHUR J.
Analysis of Pile Groups with Flexural Resistance, 600
See W. Terence O'Brien

FRANZINI, JOSEPH B.
Hydraulics of Thin Film Flow, with Nabil A. Hassan, 23
See Nabil A. Hassan

FRAZIER, NOAH A.
See George M. McClure

FREEMAN, J. C.
Wave Breakers on a Beach and Surges on a Dry Bed, with Bernard LéMehauté, 759

FRENCH, FRANCIS W.
See Lawrence J. Mente

FRENCH, JOHN L.
Tapered Inlets for Pipe Culverts, 375

FROST, RONALD W.
Behavior of Hybrid Beams Subjected to Static Loads, with Charles G. Schilling, 604

FUCIK, E. MONTFORD
Consulting Engineering in Foreign Countries, 21

GALAMBOS, THEODORE V.
See Ralph C. Van Kuren

GARDE, R. J.
Regime Criteria for Alluvial Streams, with K. G. Ranga Raju, 178

GARRISON, JACK M.
See Rex A. Elder

GARRISON, WALTER E.
See John D. Parkhurst

GARTH, WALTER WILLIAM
Memoir of, 821

GATES, MARVIN
Blasting Design Criteria, 269

GAZIS, DENOS C.
Analytical Methods in Transportation: Mathematical Car-Following Theory of Traffic Flow, with Robert Herman and Richard W. Rothery, 78

GERWICK, BEN C.
Precast Segmental Construction for Long-span Bridges, 44

GILLESPIE, JAMES N.
Frequency Analysis of Beams by Flexibility Method, with Boen-Dar Liaw, 233

GILLIGAN, J. A.
Higher-Strength Structural Steels, 551

GILLIS, DON
Golden Gateway—Construction (Symposium), 61

GILMAN, JAMES MOSELEY
Memoir of, 822

GINSBURG, THEO
Propagation of Shock Waves in the Ground, 275

GLAUZ, WILLIAM D.
See John E. Goldberg

GLEASON, WILLIAM J., JR.
First Five Years of the Critical-Path Method, with Joseph J. Ranieri, 40

GLICKSTEIN, AARON
Analytical Methods in Transportation: Digital Simulation of Traffic, 498

GLOCKNER, P.
See A. J. Celis

GLOYNA, EARNEST F.
Heat Generation by Radioactive Wastes, with H. J. Longley and C. W. Christenson, 636
See Joe E. Ledbetter

GOBLE, GEORGE G.
Analysis of Folded Plate Structures, 387

GODDARD, JAMES E.
Flood Plain Management Improves Man's Environment, 24

GOLDBERG, JOHN E.
Buckling of a Prestressed Circular Ring, with John L. Bogdanoff, 767
General Computer Analysis of Beams, with John L. Bogdanoff and William D. Glauz, 80

GOODMAN, LOUIS J.
Problems of Off-Road Transportation, with Ronald A. Liston, 53

GOTTHEIM, IRVING
Memoir of, 823

GOULD, HOWARD R.
Old Method with New Twist Solves Bank Shoring Problem, 105

GRANT, LELAND F.
Concept of Curtain Grouting Evalation, 349

GRANT, LLOYD MURRAY
Memoir of, 824

GRAVES, ERNEST, JR.
Nuclear Excavation of a Sea-Level Isthmian Canal, 461

GRAVES, FRED A.
Stronger Structural Bolt—Will Cut Costs, Speed Construction, with W. A. Milek, 557

GREEN, H. SPENCER
New Tainter Gate Hoist, 266

GREGORY, MALCOLM S.
Philosophy of Engineering Design of Structures, 59

GRIMES, ROBERT O.
Houston's Jetero Airport: Development of Terminal and Related Areas, 263

GRINTER, LINTON E.
See Donald A. Sawyer

GROSECLOSE, J. K.
Deflection of Tall Guyed Tower in Dallas, 571

HACKNEY, JOHN W.
Unit Prices Around the World, ASCE Construction Division Committee Report, 362

HAHN, FRANCIS A.
Box Type Mat Solves Foundation Problem for Syracuse Housing Project, 297

HAIKALIS, GEORGE
Evaluating Urban Transportation Systems, with E. Wilson Campbell, 479

HAISE, HOWARD R.
See Marvin E. Jensen

HAKE, BRUNO H.
Baggage Handling: Passenger and Baggage Processing at Air Terminals, 203

HALL, JOHN R., JR.
Dissipation of Elastic Wave Energy in Granular Soils, with Frank E. Richart, Jr., 663

HALL, J. R.
The case for the Galvanized Bridge, 564

HALL, WARREN A.
Optimum Design of Multi-Purpose Reservoirs, 762

HALLIWELL, A. R.
Velocity of a Water-Hammer Wave in an Elastic Pipe, 1

HAMMAD, HAMMAD Y.
Design of Tile Drainage for Arid Regions, 749

HANSEN, ROGER M.
See Robert A. Bendigo

HANTUSH, MAHDI S.
Supplement to Peterson's Design of Replenishment Wells, 101

HARVEY, JOHN W.
Buckling Loads for Stepped Columns, 618

HASSAN, NABIL A.
Film Flow Along A Vertical Cylinder, with Joseph B. Franzini, 761
See Joseph B. Franzini

HAUCK, GEORGE F.
Stability of Elasto-Plastic Wide-Flange Columns, with Seng-Lip Lee, 94
See Seng-Lip Lee

HAUSSLER, ROBERT W.
Strength of Elastically Stabilized Beams, 637

HAYDEN, ARTHUR GUNDERSON
Memoir of, 825

HAYNE, DANIEL CARLOS
Memoir of, 826

HEIDEBRECHT, ARTHUR C.
Dynamic Analysis of Elastic-Plastic Frames, with Seng-Lip Lee and John F. Fleming, 33

HELLER, GEORGE W.
Quantity Surveys for Cost Estimates, 333

HENDRICKSON, JOHN G.
See Howard F. Peckworth

HERMAN, M. JUSTIN
Golden Gateway—General Concept (Symposium), 17

HERMAN, ROBERT
See Denos C. Gazis

HERRERA, ISMAEL
See Emilio Rosenblueth

HERRMANN, LEONARD R.
Bending Analysis for Clamped Rectangular Plates, 251

HERSHFIELD, DAVID M.
Effective Rainfall and Irrigation Water Requirements, 741

HO, HAU-WONG
See Lucien M. Brush

HOGAN, BEN MILES
Memoir of, 827

HOLDAMPF, CARL RICHARD
Memoir of, 827

HOLLAND, EUGENE P.
See Alfred L. Parme

HOMBURGER, WOLFGANG S.
Automobile Parking Requirements at Airports, with William R. Eager, 805

HOOLEY, R. F.
Lateral Stability of Glued Laminated Beams, with B. Madsen, 781

HOOPER, D. R.
See R. P. Ware, 735

HORIKAWA, KIYOSKI
See R. L. Wiegel, 719

HORONJEFF, ROBERT
Civil Aviation to 1970, with Gale Ahlborn, 18

HOTZ, ALVIN J., JR.
Epoxy-Lined Pipe Reduces Cost of San Buenaventura Trunk Sewer, 501

HOUSNER, G. W.
Generation of Artificial Earthquakes, with P. C. Jennings, 530

HRIBAR, JOHN A.
See E. D'Appolonia

HSIEH, TSUYING
Resistance of Cylindrical Piers in Open-Channel Flow, 657

HU, GEORGE C. Y.
Variable-Factors Theory of Bearing Capacity, 291

HU, LING-WEN
See Joel Markowitz

HUANG, TSENG
Response of Structures to Triangular Pulse Loading, 327

HUBBELL, DAVID W.
Sand Transport Studies with Radioactive Tracers, with William W. Sayre, 619

HUBER, ROBERT C.
An Operational Look at Airport Design, 566

HUCKERBY, J. K.
See Hal W. Hunt, 715

HUDSON, DONALD E.
Resonance Testing of Full-Scale Structures, 655

HUELSMAN, ALBERT W.
Driveway Approaches Designed for Automobile Access, 261

HUEY, STANTON E.
Design of Haunched Beams by Fixed Points, 613

HUGGINS, M. W.
See J. B. Kennedy

HUNT, HAL W.
Belgian 223-Ft Barge Lift Keeps Vessels Afloat on-Inclined Railway, with J. K. Huckerby, 715
Engineered Construction in Sweden, 708
Mapping the World, 71

HYLAND, JOHN R.
Rubble-Mound Breakwater Design for Refuge Harbor, 597

IRVIN, LESLIE
See William A. Bugge

IYENGAR, K. T. SUNDARA RAJA
Finite Beam-Columns on Elastic Foundation, with S. Anantharamu, 141
Stresses in a Layered Half-Plane, with R. S. Alwar, 404

JACOBSEN, LYDIK S.
Vibrational Transfer from Shear Buildings to Ground, 691

JACOBSON, GEORGE LLOYD
Memoir of, 828

JELEN, VICTOR F.
Professional Development, the Younger Viewpoint (Symposium)—In Public Practice, 283

JENNINGS, PAUL C.
Periodic Response of a General Yielding Structure, 121
See G. W. Housner

JENSEN, MARVIN E.
Estimating Evapotranspiration from Solar Radiation, with Howard R. Haise, 107

JESSUP, WALTER E.
Baldwin Hills Dam Failure, 137

JOHNSON, C. V.
See H. A. Sikso

JOHNSON, HARVEY J.
See Martin E. Nelson

JOHNSON, NORMAN L.
Forecasting Airport Traffic, 665

JOHNSON, R. H., JR.
See M. W. Tenney

JOHNSON, R. W.
Effect of the Space Age on the Engineering Profession, 247

JONAS, DOUGLAS L.
Seattle Viaduct Redesigned Using CPM, with Roy W. Morse and John E. Arnberg, 523

JONES, DAN S., JR.
Desirable Features of Water Rights Laws, 512

JONES, KEITH
Yellowtail Dam on Big Horn River, Instrumented for Structural Behavior Studies, 567

JONES, RUSSEL C.
Professional Development, the Younger Viewpoint (Symposium)—In Teaching, 284

JONSSON, IVAR G.
See H. Lundgren

JORDAN, MICHAEL
Constant Shear Moment Distribution, 34

KABELAC, OTAKAR W.
Regulation of the Caspian Sea, 609

KAO, JAO-SHIUN
See Toshio Mura

KARARA, HOUSSAM M.
Planning and Design of Aerotriangulation Projects, 424
Simultaneous Relative Orientation of Multiple Cameras, with Atef A. Elassal, 70

KARPOV, ALEXANDER
Indus Valley—West Pakistan's Life Line, 509

KATES, LEONARD
Die Cutting Cuts Cost of Open-Web Steel Beams, 313

KAZMIERCZAK, E.
See Harvey F. Ludwig,

KEANE, JOHN A.
Manpower by Critical Path Method, with Jack D. Trawick, 288

KELLY, RAY D.
Supersonic Transport Development Program, 555

KENNEDY, J. B.
Series Solution of Skewed Plates, with M. W. Huggins, 308

KENNEY, T. CAMERON
Stability of Cuts in Soft Soils, 171

KESHAVAN, K.
Kinetics of Aerobic Removal of Organic Wastes, with V. C. Behn and W. F. Ames, 770

KETT, IRVING
Resident Engineer Responsibility on Construction, 15

KIERSCH, GEORGE A.
Vaiont Reservoir Disaster, 155

KINDINGSTAD, EIVIND
Mathematical Model for Transient River Flow, 682

KING, ELWYN H.
Guide to Development and Use of Electronic Computer Programs: Engineering Analysis, 775

KING, IAN P.
See Ray W. Clough

KLEIMAN, WILLIAM F.
Use of Surcharges in Highway Construction, 623

KNIGHT, GAIL B.
Subway Tunnel Construction in New York City, 503

KOBUS, HELMUT E.
See Eduard Naudascher

KOELZER, VICTOR A.
Hydrology of Spillway Design: Large Structures—Limited Data, with Marcel Bitoun, 569

KOENIG, EUGENE H.
New Techniques for Very Accurate Measurement, 358

KONDNER, ROBERT L.
Consolidation Coefficient: Cohesive Soil Mixtures, with José R. Vendrell, Jr., 629
See Bruce B. Schimming
See Raymond J. Krizek

KORKIGIAN, IRA M.
Channel Changes in the St. Clair River Since 1933, 5

KOSTRO, GEORGE
The Triangular Bar Chart, 538

KRAVITZ, R. A.
Increasing the Efficiency of Helicopters on Transmission-Line Construction, with E. S. Zobel, 489

KRIEGER, JAMES H.
The Law of the Underground, 167

KRISHANAYYA, A. V. GOPALA
See V. J. Patel

KRIZEK, RAYMOND J.
Settlement Response Caused by Footing Groups, with Robert L. Kondner, 659

KUECH, ROBERT WALTER
Memoir of, 829

KUIKARNI, MANGESH G.
See Kaveti Seetharamulu

LACKMAN, LESILE M.
Circular Plates Loaded into the Plastic Region, 787
See T. H. Lin

LADD, CHARLES C.
Stress-Strain Modulus of Clay in Undrained Shear, 589

LAING, JOHN J.
Asphalt Paving Equipment, 475

LANG, C. H.
Expressway Maintenance: Costs and Problems in Urban Areas, 317

LANGBEIN, WALTER B.
Geometry of River Channels, 679

LARSON, CARL S.
Oregon Sets the Pace on the Interstate, 196

LAVERTY, BRUCE R.
Design and Performance of Mammoth Pool Power Tunnel, with Klaus R. Ludwig, 416

LAWLER, CHARLES A.
Trends in Automobile Parking at Airports, 583

LEDBETTER, JOE E.
Predictive Techniques for Water Quality-Inorganics, with Earnest F. Gloyna, 193

LEE, CHARLES E.
Small-Craft Harbor Problems, 647

LEE, DOUGLAS R.
Daylight Star Observations in Antarctica, 221

LEE, GEORGE C.
See Sherwood P. Prawel, Jr.

LEE, SENG-LIP
Buckling of Steel Columns Under Arbitrary End Loads, with G. F. Hauck, 73
See Arthur C. Heidebrecht
See B. J. Thorn
See Frederick P. Wiesinger
See George F. Hauck
See Toshio Mura

LéMEHAUTÉ, BERNARD
See J. S. Freeman

LENARD, JOHN F.
Precast T's and Slabs Make Culverts Quickly, 431

LEW, H. S.
See P. B. Cooper

LI, C. Y.
Colombia—Flow Slides Prove Hazardous in Tenche Tunnel and Diversion Tunnel for Miraflores Dam, 727

LI, WEN-HSIUNG
Pressure Generated by Cavitation in a Pipe, with James P. Walsh, 789

LIAW, BOEN-DAR
See James N. Gillespie

LIN, T. H.
Relief of Residual Stresses by Heating Patterns, with Leslie M. Lackman, 675

LIND, NIELS C.
Iterative Limit Load Analysis for Tall Frames, 661

LISTON, RONALD A.
See Louis J. Goodman

LOGAN, JOHN A.
Report on Engineering Foundation's Research Conference on Urban Transportation, 201

LOKKEN, E. C.
What's New in Concrete Paving, 151

LONG, ERWIN L.
The Long Thermopile, 189

LONG, L. D.
Quality Control of Concrete, 549

LOO, TA-CHENG
Experiments on Stability on Spherical Caps, with Ross M. Evan-Iwanowski, 69

LOYD, HAROLD L.
Professional Development, the Younger Viewpoint (Symposium)—In Private Practice, 283

LUDWIG, HARVEY F.
Waste Disposal and the Future at Lake Tahoe, with E. Kazmierczak and Ralf C. Carter, 229

LUDWIG, KLAUS R.
See Bruce R. Laverty

LUND, S.
Bridges on Stockholm Motorway, 731

LUNDGREN, H.
Shear and Velocity Distribution in Shallow Channels, with Ivar G. Jonsson, 693

LYNN, WALTER R.
See Gordon P. Fisher
See M. Mead Montgomery

MADSEN, B.
See R. F. Hooley

MAGNUSON, SENATOR WARREN G.
A Sea-Level Canal to Link the Atlantic and the Pacific, 405

MANN, ANTHONY P.
Underwater Inspection of Test Fill in Gatun Lake for Dam to Serve Panama Canal, Anthony P. Mann, 241

MARKOWITZ, JOEL
Plastic Analysis of Orthotropic Circular Plates, with Ling-Wen Hu, 630

MARTIN, HAROLD M.
Practical Results of Hydraulics Research: Hydraulics Division Committee on Research, 347

MARTIN, W. R.
Roll-Ramp Lifting Device for Fishway at Priest Rapids Dam, 535

MARULIC, WALTER J.
See Jeng C. Shang

MASUR, ERNEST F.
Development of Boundary Layers in Buckled Plates, with C. H. Chang, 67

MATEOS, MANUEL
Soil-Lime Research at Iowa State University, 433

MAUZY, HARRIS K.
Bridge Costs in California, with William J. Yusavage, 133

MAYO, ROBERT S.
Machine Tunneling in Chicago Clays, 160

McCLURE, GEORGE M.
Analysis of Blast Effects on Pipelines, with Thomas J. Atterbury and Noah A. Frazier, 603

McIVOR, IVOR K.
Dynamic Stability of Axially Vibrating Columns, 714

McJUNKIN, FREDERICK E.
Population Forecasting by Sanitary Engineers, 782

McKINNEY, ROSS E.
Complete Mixing of Activated Sludge—Something for Nothing, 413

MEDEARIS, KENNETH
Energy Absorption of Structures Under Cyclic Loading, with D. H. Young, 249

MEISSNER, HAROLD G.
Incineration (Symposium)—Air Pollution from Incinerators, 495

MENTE, LAWRENCE J.
Response of Elastic Cylinders to Plane Shear Waves, with Francis W. French, 681

MICHAEL, HAROLD L.
Interdisciplinary Education for Urban Planning, 797

MIDO, KIYOSHI M.
See Robert Y. D. Chun

MIDWINTER, JAMES
As a Contractor, Do You Carry Adequate Insurance?, 371

MILEK, WILLIAM A.
See Fred A. Graves

MILES, WALTER FRANK
Memoir of, 830

MILLER, CHARLES L.
The Scope of Civil Engineering, 385

MILLER, HAROLD ELROY
Memoir of, 831

MILLER, JOHN S.
Prestressed-Concrete Water Line Laid near Fresno at Rate of 200 Ft Per Hour, 195

MIRAJGAOKER, A. G.
Natural Roughness Effects in Rigid Open Channels, with K. L. N. Charlu, 544

MITCHELL, JAMES K.
Current Lunar Soil Research, 390
Shearing Resistance of Soils as a Rate Process, 369

MITCHELL, LEWIS R.
See Robert Y. D. Chun

MOELLER, DADE W.
See Conrad P. Straub

MONFORTON, G. R.
Matrix Analysis of Semi-Rigidly Connected Frames, with T. S. Wu, 149

MONTGOMERY, M. MEAD
Analysis of Sewage Treatment Systems by Simulation, with Walter R. Lynn, 361

MOORE, WILLIAM W.
Golden Gateway—Foundation Design (Symposium), 31

MOREL-SEYTOUX, HUBERT J.
Domain Variations in Channel Seepage Flow, 176

MORRIS, CHARLES CHESTER
Memoir of, 832

MORRIS, J. CARRELL
See Walter J. Weber

MORRIS, M. D.
Inventory Index Proposed for Testing Apparatus, 331

MORSE, EVERETT D.
Control Traverses and Their Adjustment, 181

MORSE, ROY W.
Seattle Viaduct Redesigned Using CPM, with John E. Arnberg and Douglas L. Jonas, 523

MOSURE, THOMAS F.
See Thomas D. Y. Fok

MUELLER, IVAN I.
Vertical Gradient of Gravity, 235

MUELLER, N. H. G.
Water Jet Pump, 311

MUIR, J. F.
Interest on Capital Invested in Construction, with Eugen Ruus, 635

MURA, TOSHIO
Limit Analysis of Circular Orthotropic Plates, with Jao-Shiun Kao and Seng-Lip Lee, 607

MURALIDHAR, D.
See N. Rajaratnam

MURPHY, W. D.
Machine Tunneling For Storm Sewer Under Houston, 393

NAUDASCHER, EDUARD
Hydrodynamic Analysis for High-Head Leaf Gates, with Helmut E. Kobus and Ragam Panda R. Rao, 746

NELSON, MARTIN E.
Navigation Locks: Filling and Emptying Systems for Locks, with Harvey J. Johnson, 398

NEUBERT, V. H.
Lumping of Mass in Calculating Vibration Response, 219

NEWMAN, GENE J.
See S. Chas. Dearstyne

NICHOLLS, ROBERT B.
How a Waterway Improvement Changed Environment, 641

NICKELSBERG, ROBERT S.
Ground Control of Airport Traffic, 573

NIMR, AHMED EL
Seepage from Parallel Trapezoidal Channels, 127

NISSEL, NEIL
See William P. Vafakos

NIYOMTHAI, CHALEO
See Norbert L. Ackermann

NORCROSS, THEODORE WHITE
Memoir of, 833

NORDIN, CARL F., JR.
Study of Channel Erosion and Sediment Transport, 277

NORDMARK, GLENN E.
Fatigue of Joints in Aluminum Alloy 6061-T6, with John W. Clark, 744

O'BRIEN, W. TERENCE
Cable Movements Under Two-Dimensional Loads, with Arthur J. Francis, 737

OGROSKY, HAROLD O.
Hydrology of Spillway Design: Small Structures—Limited Data, 367

O'HARA, G. J.
Numerical Method for Structural Shock Response, with Patrick F. Cuniff, 169

O'MARA, JOHN J.
Electronic Guidance for Highway Safety, 519

ORLOB, GERALD T.
Lost River System—A Water Quality Management Study, with Philip C. Woods, 87

OSBORN, J. F.
See A. F. Pillsbury

O'SHERIDAN, THOMAS C.
See Charles G. Salmon

PABARCIUS, ALGIS
See Kuang-Han Chu

PAPP, REMIG A.
Pier Extension and Repair at Tallmans Island Sewage Treatment Plant at College Point, 306

PARKHURST, JOHN D.
Whittier Narrows Water Reclamation Plant, with Walter E. Garrison, 499

PARME, ALFRED L.
Parabolic Arches of Variable Thickness, with Eugene P. Holland, 779

PARMELEE, RICHARD A.
See Joseph Penzien

PATEL, V. J.
Mechanics of Inclined Filters in Earth Dams, with A. V. Gopala Krishnayya and K. L. Arora, 457

PAYNE, H. L.
Can the Civil Engineer be a Manager, 293

PEARSON, A. S.
Lightweight Aggregate Prepared from Fly Ash by Consolidated Edison in New York City, 411

PECK, RALPH B.
Foundation Behavior of Iron Ore Storage Yards, with Tonis Raamot, 783

PECKWORTH, HOWARD F.
Gravity Flow Reinforced Concrete Pipe Design, with John G. Hendrickson, 584

PELISHEK, R. W.
See A. F. Pillsbury

PEMBERTON, ERNEST L.
Sediment Investigations—Middle Rio Grande, 187

PENZIEN, JOSEPH
Seismic Analysis of Bridges on Long Piles, with Charles F. Scheffey and Richard A. Parmelee, 321

PETERS, JOHN
Stabilization of Sand Dunes at Vandenberg Air Force Base, with Joe Sciandrone, 344

PETERSEN, MARGARET S.
Hydraulic Aspects of Arkansas River Stabilization, 625

PETERSON, BEN LEO
Memoir of, 834

PILLAI, NARAYANA N.
Shapes for Appurtenances in Stilling Basins, with T. E. Unny, 643

PILLSBURY, A. F.
An Experiment on Flow Through Smooth Tile Joints, with E. H. Taylor, R. W. Pelishek, and J. F. Osborn, 455

PINCUS, HOWARD J.
Retreat of Lakeshore Bluffs, 343

POPE, WENDELL L.
See Lyman S. Willardson,

PRAWEL, SHERWOOD P., JR.
Biaxial Flexure of Columns by Analog Computers, with George C. Lee, 185

PRICE, JAMES T.
See Rex A. Elder

PRICKETT, THOMAS A.
See William C. Walton

PRYOR, WILLIAM T.
Surveying and Mapping and Environmental Engineering, 631

RAJARATNAM, N.
End Depth for Circular Channels, with D. Muralidhar, 407
End Depth for Exponential Channels, with D. Muralidhar, 765

RAJU, RANGA K. G.
See R. J. Garde

RAMSEIER, ROY E.
Low Pressure Air Test for Sanitary Sewers, with George C. Riek, 677

RANIERI, JOSEPH J.
See William J. Gleason, Jr.

RAO, RAGAM PANDA R.
See Eduard Naudascher

RATNAM, M. V.
See Bengt B. Broms

RAUDKIVI, A. J.
Study of Sediment Ripple Formation, 110

RAWLINGS, BARRY
Dynamic Plastic Analysis of Steel Frames, 649

RAY, GORDON K.
History and Development of Concrete Pavement Design, 91

REAMS, CHATHAM COFFEE
Memoir of, 835

REESE, JOSEPH L., JR.
See Paul W. Forehand

REILLY, PETER
See Herbert Rothman

RENEKER, W. DANIEL
Flexural Fatigue Tests of Prestressed Steel I-Beams, with Carl E. Ekberg, Jr., 561

RETI, G. A.
Slope Stabilized by Anchored Retaining Wall, 216

RICE, E. F.
The Alaska Earthquake—Effect on Buildings, 223

RICHARDSON, EVERETT V.
See Frederick C. Stepanich

RICHARDSON, GEORGE C.
Navigation Locks: Navigation Lock Gates and Valves, 394

RICHART, FRANK E., JR.
See John R. Hall, Jr.

RIEK, GEORGE C.
See Roy E. Ramseier

RIHM, ALEXANDER
Air Pollution Control in New York State, 89

RILEY, WALTER E.
Post-Tensioned Shallow Roof Shells for Syracuse Schools, 421

RILEY, WILLIAM F.
Stresses at Tunnel Intersections, 615

RILEY, W. F.
See C. W. Beadle

RINGO, BOYD C.
Model Balsa-Wood Bridges in Education, 83

RIVER, ROBERT BEAUDON
Memoir of, 836

ROSENBLUETH, EMILIO
On a Kind of Hysteretic Damping, with Ismael Herrera, 521

ROTHERY, RICHARD W.
See Denos C. Gazis

ROTHMAN, HERBERT
Computer Systems for Matrix Operations, with Peter Reilly, 763

ROWE, PETER W.
Importance of Free Ends in Triaxial Testing, with Laing Barden, 363

RUCKER, WHEELER H., JR.
Alternate Design Proves Economy of Precast Prestressed Design for Seattle Pier Shed, 231

RUMPF, JOHN L.
Calibration of A325 Bolts, with John W. Fisher, 295
See Robert A. Bendigo

RUUS, EUGEN
See J. F. Muir

SAAFAN, S. A.
Nonlinear Behavior of Structural Plane Frames, 197

SALMON, CHARLES G.
'nfluence-Line Spectrum by Graphical Construction, 428
Laboratory Investigation of Unstiffened Triangular Bracket Plates, with Donald R. Buettner and Thomas C. O'Sheridan, 436

SALSBURY, M. E.
Metropolitan Drainage Planning In Los Angeles County, 209

SAUNDERS, ARVEN H.
Operational Experience at Dulles Airport, 795

SAWYER, DONALD A.
Minimum Weight Plastic Design of Continuous Frames, with Linton E. Grinter, 711

SAYRE, WILLIAM W.
See David W. Hubbell

SCHEFFEY, CHARLES F.
See Joseph Penzien

SCHILLING, CHARLES G.
See Ronald W. Frost

SCHIMMING, BRUCE B.
Auxiliary Potential Function for Seepage, with Robert L. Kondner, 769

SCHLEUSENER, RICHARD A.
Weather Modification, 199

SCHMID, ERWIN
Plane Coordinate Systems and Map Projections, 444

SCHNELLER, FRANK J.
A Special Report on the World's Fair, 487

SCIANDRONE, JOE
See John Peters

SCORDELIS, ALEXANDER C.
See Arnim DeFries-Skene

SEBRUN, THOMAS J.
Roadway Lighting, 442

SEETHARAMULU, KAVETI
Analysis of Short Span Folded Plates, with Mangesh G. Kulkarni, 699

SEGNER, EDMUND P., JR.
Reinforcement Requirements for Girder Web Openings, 645

SHAFFER, L. R.
Analytic Methods in Transportation: Planning and Grading Operation for Least Total Cost, 296

SHAH, HARESH C.
Regression Analysis of Reinforced Concrete Columns, 345

SHAHROODY, ALI M.
Efficiency of Pumping from Small Circular Sumps, with John R. Davis, 339

SHANG, JENG C.
Buckling of Longitudinally Stiffened Cylinders, with Walter J. Marulic and Rolland G. Sturm, 667

SHARP, BRUCE B.
Flow Measurement with a Suspension Wire, 467

SHAW, F. S.
Limit Analysis of Grid Frameworks, 330

SHERBOURNE, A. N.
Numerical Methods in Bending and Buckling of Plates, 51

SHULDINER, PAUL W.
See Joseph A. Wattleworth

SHULESHKO, P.
Solution of Buckling Problems by Reduction Method, 315

SHUTE, RICHARD M.
Professional Development, the Younger Viewpoint (Symposium)—In Industry, 285

SIEV, AVINDAV
Stress Analysis of Prestressed Suspended Roofs, with J. Eidelman, 518

SIKSO, H. A.
Pressure Cell Observations—Garrison Dam Project, with C. V. Johnson, 653

SILVERMAN, ISADORE K.
Orthotropic Beams Under Polynominal Loads, 634

SILVESTER, R.
Hydraulic Jump in All Shapes of Horizontal Channels, 75

SIMMONS, WILLIAM P.
Transitions for Canals and Culverts, 35

SIMON, ANDREW L.
Travel Time of Waves in Backwaters, 84

SIMONS, DARYL B.
See Frederick C. Stepanich

SINCLAIR, JOSEPH PIERCE
Memoir of, 837

SINGH, KRISHAN PIARA
Nonlinear Instantaneous Unit-Hydrograph Theory, 497

SKARPELOS, JOHN M.
See Richard F. Foster

SLITER, GEORGE E.
Elastica Supported at Midpoint by a Spring, with Arthur P. Boresi, 147

SMITH, PETER M.
Hydraulic Downpull on Ice Harbor Powerhouse Gate, 574

SNYDER, FRANKLIN F.
Hydrology of Spillway Design: Large Structures—Adequate Data, 587

SODERBERG, ARTHUR D.
Irrigation Development in a Subhumid Area, 640

SOLOMON, JACOB
Structure Designs Governed by Limited Deformations, 477

SONG, CHIEH-SHYANG
Von Mises Transformation for Boundary Layer Theory, 239

SOWERS, GEORGE F.
Fill Settlement Despite Vertical Sand Drains, 685

SPARACIO, RENATO
See Vicenzo Franciosi

SPEIR, OSWALD
Memoir of, 838

STEMLER, J. ROBERT
What Is Available in Structural Aluminum, with John W. Clark, 213

STENBURG, ROBERT L.
Incineration (Symposium)—Incineration of Community Wastes, 494

STEPANICH, FREDERICK C.
Control Structures for Sand-Bed Channels, with Daryl B. Simons, and Everett V. Richardson, 485

STEPHENSON, JUNIUS W.
Incineration (Symposium)—Specifications and Responsibility for Incinerator Plant Performance, 493

STERBENZ, FREDERICK H.
The Additional Cooper River Bridge, 513

STEVENS, H. H., JR.
An Electric-Powered Vehicle for Large River Measurements, with G. R. Dempster, Jr., 480

STOKES, RALPH C.
See James R. Ayers

STRAUB, CONRAD P.
Environmental Behavior of Nuclear Debris, with Melvin W. Carter and Dade W. Moeller, 764

STREET, ROBERT L.
Two-Dimensional Jet and Cavity Flows, 113
See Gary Z. Watters

STREETER, VICTOR L.
Waterhammer Analysis of Pipelines, 591

STURM, ROLLAND G.
See Jeng C. Shang

SUESS, MICHAEL J.
Surface Area Measurements and Adsorption of Soils, 131

SURKIS, JULIUS
See Restan M. Aras

SVORE, JEROME H.
Sewage Lagoons and Man's Environment, 409

SYLVESTER, ROBERT O.
A Lake's Response to Its Environment, with George C. Anderson, 11

SYMONS, J. M.
See M. W. Tenney

TANIMOTO, BENNOSUKE
Eigen-Matrix Method for Beams and Plates, 103

TAYLOR, E. H.
See A. F. Pillsbury

TEIXEIRA, STANLEY E.
Golden Gateway—Superstructures (Symposium), 49

TENNEY, M. W.
Minimal Solids Aeration Activated Sludge, with R. H. Johnson, Jr. and J. M. Symons, 705

TEZCAN, SEMIH S.
Moment Equations for Computer Analysis of Frames, 673

THELEN, ARTHUR
See Kuang-Han Chu

THIBODEAUX, MURPHY H.
Arc Lengths and Curvature of Parabolic Segments, 622

THOMANN, ROBERT V.
Mathematical Model for Dissolved Oxygen, 153

THOMPSON, CHARLES B.
Study of Municipal and Irrigation Water Shortages, 446

THOMPSON, GUSTAVUS WILLIAM
Memoir of, 839

THONUS, ROBERT J.
Construction Preplanning Pays Off, 575

THORFINNSON, STANLEY T.
See Lloyd B. Underwood

THORN, B. J.
Linear Strain Hardening of Cylindrical Shells, with Seng-Lip Lee, 752

TRAWICK, JACK D.
See John A. Keane

TSCHEBOTARIOFF, GREGORY P.
Vibration of Gas Compressor Foundation Controlled by Chemical Grouting, 253

TUMA, JAN J.
See Delbert C. Carman

TUNG, CHARLES P. C.
A Cooperative Computer Center, A New Concept for Consulting Engineers, with David Carsen, 401

TURNER, H. C., JR.
The Value of Management in the Construction Industry, 163

TUTTLE, LANSING
Paving Roof Decks and Industrial Floors, 301

TYSON, HOWELL N.
Ground-Water Management for the Nation's Future—Computer Simulation of Ground-Water Basins, with Ernest M. Weber, 760

UNDERWOOD, LLOYD B.
Rebound in Redesign of Oahe Dam Hydraulic Structures, with Stanley T. Thorfinnson and William T. Black, 47

UNDERWOOD, TOM L.
Section Modulus of Beams with Unsymmetrical Cover Plates, 286

UNNY, T. E.
See Narayana N. Pillai

VAFAKOS, WILLIAM P.
Parametric Expansions for Oval Reinforced Rings, with Neil Nissel, 577

VALANTINE, VERNON E.
Ground-Water Management for the Nation's Future—Effecting Optimum Ground-Water Basin Management, 733

VALLENTINE, HAROLD R.
Characteristics of the Backwater Curve, 755

van der BURGH, P.
See G. Abraham

VAN HOUTEN, LEONARD E.
The Bow Mooring for Berthing Tankers, with G. A. McCammon, 125

VAN KUREN, RALPH C.
Beam Column Experiments, with Theodore V. Galambos, 9

VARADARAJULU, G. H.
See M. Anandakrishnan

VELTROP, JAN A.
See Andrew Eberhardt
See W. A. Waldorf

VENDRELL, JOSÉ R., JR.
See Robert L. Kondner

VERES, SANDOR A.
Aerial Traverse and Maximum Bridging Distance, 211

VITOLS, VILIS
Analysis of Composite Beam Bridges by Orthotropic Plate Theory, with Rodney J. Clifton and Tung Au, 3

WAH, THEIN
Analysis of Laterally Loaded Gridworks, 481

WALDORF, W. A.
Foundation Modulus Tests for Karadj Arch Dam, with J. A. Veltrop and J. J. Curtis, 271

WALL, DOUGLAS E.
A Study of Hypersonic Aircraft, 799

WALSH, JAMES P.
See Wen-Hsiung Li

WALTON, WILLIAM C.
Hydrogeologic Electric Analog Computer, with Thomas A. Prickett, 43

WANG, CHU-KIA
General Computer Program for Limit Analysis, 161

WANG, SHOU-LING
Flexural Calculation of Nonuniform Members, 164

WARD, GENERAL C.
Optical Tooling for Precise Structural Measurements, with John F. Ely, 225

WARD, JOHN C.
Annual Variation of Stream Water Temperature, 258

WARD, JOSEPH S.
Starting a Consulting Business, 7

WARE, R. P.
Ghana's Akosombo Dam—Design and Construction, with D. R. Hooper, 735

WARREN, W. L.
Roadside Planting in California, 373

WARSKOW, MARTIN A.
Analysis of Master Plan for Chicago O'Hare Airport, with Howard C. Burns, 63

WATTERS, GARY Z.
Two-Dimensional Flow Over Sills in Open Channels, with Robert L. Street, 766

WATTLES, W. C.
Surveyors' Footsteps, 208

WATTLEWORTH, JOSEPH A.
Analytic Methods in Transportation: Left Turn Penalties in Traffic Assignment Models, with Paul W. Shuldiner, 346

WEAVER, RALPH
Preliminary Design of Concrete Dams by Computers, 99

WEBER, ERNEST M.
See Howell N. Tyson

WEBER, WALTER J., JR.
Equilibria and Capacities for Adsorption on Carbon, with J. Carrell Morris, 525

WEGMAN, LEONARD S.
Incineration (Symposium)—Incinerator Planning, 491

WEIDLINGER, PAUL
Temperature Stresses in Tall Reinforced Concrete Buildings, 377

WEISS, LEONARD L.
Ratio of True to Fixed-Interval Maximum Rainfall, 66

WEMPNER, G. A.
Axisymmetrial Deflections of Shallow Conical Shells, 628

WEWER, OLE
Slipforming a Chimney 450 Ft High in Nottingham, 739

WHIPPLE, WILLIAM, JR.
Civil Engineers Build for the Fair, 483

WHITE, GILBERT B.
A City Engineer Talsk about Paving, 278

WHITE, HAROLD H.
New Light on Blasting Vibration Effects, 252

WHITTINGTON, RICHARD B.
Simple Dimensional Method for Hydraulic Problems, 135

WIEGEL, R. L.
Coastal Engineering in Japan, with Kiyoshi Horikawa, 719

WIESINGER, FREDERICK P.
Moment Coefficients for Frame Analysis, with Seng-Lip Lee and John F. Fleming, 39

WIGGINS, JOHN H., JR.
Effect of Site Condition on Earthquake Intensity, 415

WILLARD, EDWIN RUTHVEN
Memoir of, 840

WILLARDSON, LYMAN S.
Separation of Evapotranspiration and Deep Percolation, with Wendell L. Pope, 56

WILLIAMS, HERBERT S.
Analogue Aerial Triangulation, 245

WILSON, EDWARD L.
See Ray W. Clough

WISELY, WILLIAM H.
ASCE Activity in Public Affairs, 351
Civil Engineering Education, 505
Maintaining Ethical Standard, 184
Profile of a Successful Career, 129
Technical Programs in ASCE, 37
The Civil Engineer in Urban Planning, 723
The Composition of the Engineering Profession, 533

WITTENBROCK, NORMAN C.
See Richard F. Foster

WOLCHUK, ROMAN
Steel Deck Bridges with Long Rib Spans, 115

WOOD, DON J.
Environmental Missile Launch Systems, 579

WOODS, PHILIP C.
See Gerald T. Orlob

WRIGHT, JAMES R.
Professional Development-The Student's Responsibility, 793

WRIGHT, KENNETH R.
Water Right Engineering Under Appropriation System, 280

WU, I-PAI
Design Hydrographs for Small Watersheds in Indiana, 119

WU, T. S.
See G. R. Monforton

YEN, BEN-CHIE
See Lucien M. Brush

YEN, B. T.
See P. B. Cooper

YOUNG, D. H.
See Kenneth Medearis

YOUNG, DONALD F.
Dynamic Similitude of Underground Structures, with Glenn Murphy, 439

YUSAVAGE, WILLIAM J.
Bridge Costs in California, with Harris K. Mauzy, 133

ZAR, M.
Problems with High Chimneys, 64

ZOBEL, E. S.
Increasing the Efficiency of Helicopters on Transmission-Line Construction, 489

ZSUTTY, THEODORE
Error Statistics for Reinforced Concrete Beams, 158